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The Dental Cosmos

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DENTAL COSMOS:

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MONTHLY RECORD OF DENTAL SCIENCE.

Dedoted to the Interests of the Profession.

EDITED BY

JAMES W. WHITE, M.D., D.D.S.

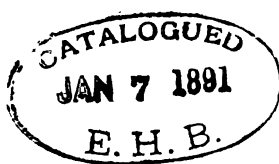
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No. 1.

ORIGINAL COMMUNICATIONS.

THE DISTINCTIVE CHARACTERS OF ANIMALS AND VEGETABLES, BEING PART OF AN INTRODUCTION TO THE STUDY OF PHYSIOLOGY.*

BY JAMES TYSON, M.D.,

PROFESSOR OF PHYSIOLOGY AND HISTOLOGY IN THE PENNA. COLLEGE OF DENTAL SURGERY, ETC.

THE sciences which have to deal with objects of nature, both organized and unorganized, are known as the PHYSICAL SCIENCES. These include Mineralogy, Botany, Zoology, and Anatomy, which consider matter as it *exists*, and hence are comprised under Natural History; and Geology, Mechanical Philosophy, Chemistry, and Physiology, which consider matter as it *acts*, and hence are included under Natural Philosophy.

The objects of nature which concern us as physiologists are the organized and organic, bearing in mind the distinction which has already been made between these terms;† and those of the physical sciences which demand our attention are Anatomy and Physiology, the former descriptive of an organism and its parts, the latter treating of their uses; the former referring to matter as it exists, the latter as it acts. Physiology, therefore, presupposes a knowledge of anatomy, and the two are inseparably associated, the study of one always involving to a greater or less extent the study of the other.

It is well known also that organized bodies are capable of further division into the two well-known kingdoms, ANIMAL and VEGETABLE, which seem strikingly easy separable and ordinarily are. When we come, however, to distinguish between the lowest forms of vegetables and the similar rank of animals, difficulties are met with which are not easily overcome. The most familiar illustration of such difficulty is per-

* The first part of this paper, which treats of the distinctive features of organized and unorganized bodies, was published in the *Dental Times*, vol. x., No. 4, April, 1873.

† An *organic* body is a substance resulting from the proximate analysis of an organized body. Thus, urea, albumen, musculin, lignin, and starch are organic bodies, but not organized structures.

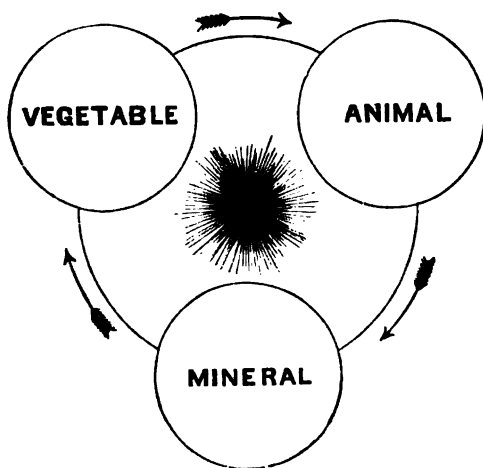
haps found in the common marine sponge (*Spongia*), which has been alternately diverted from the animal and vegetable kingdom as nice points of distinction have been discovered, but which has finally been allowed to rest in the animal kingdom.*

Scientists have long sought for some infallible distinctive feature by which the exact position of an organized body could be determined, and in this search various characters have been taken up and laid aside. Thus, *motion*, muscular or otherwise, was at one time thought to be peculiarly characteristic of animal life, but it is now well known that vegetable structures are the subject of spontaneous, though, of course, involuntary change of place, while the peculiar property of contractility is as strikingly developed in the sensitive plant (*Mimosa pudica*) as it is in the stoutest muscular tissue of the animal. Again, the *possession of a stomach* was also for a time considered peculiar to animal existence; but although it is now generally believed by the most trustworthy botanists that the special structures of the pitcher plants (*Dischidia*, *Sarracenia*), or the Chinese pitcher plant (*Nepenthes destillatoria*), and Venus's fly-trap (*Dionaea muscipula*), are not intended, as was formerly thought, for the solution preparatory to absorption of insects and such other nutrient materials as happen to be caught in them, they subserve such other purposes in retaining water and inorganic matters in solution for later use, that we cannot deny them the general offices of a stomach; while there are also low forms of animal life in which nothing comparable to a stomach is differentiated. Thirdly, difference in *chemical composition* was also erroneously made a distinguishing feature between animals and plants; but it has been for some time known that nitrogen almost as constantly presents itself in the tissues of vegetables as in those of animals.

One very striking characteristic has, however, been settled upon as much more constant than any of the foregoing, and this is the *kind of food* required by each kingdom. The plant requires *mineral substances* for its nutrition, while the animal requires *organic food*. From this it must not be inferred that animals consume only food of this kind, for it is well known that mineral substances enter largely into the composition of the food we eat, and they serve an important indirect purpose; but it is also as well known that these inorganic substances alone are incapable of sustaining life, and that the apparent exceptions sometimes quoted of certain Indian tribes who subsist upon clay, are only apparent, and that if it were not for a certain amount of

* The exact position of the sponges in the animal kingdom is still a matter of dispute, Leuckart, Miklucho-Maclay, of St. Petersburg, and Haeckel, placing them among the Cœlenterata, while the late H. J. Clarke, followed by Leidy and Allen, classes them with Infusoria.

organic matter contained in this substance, they could not live. The plant, on the other hand, demands inorganic elements, which it reunites to form its own organic structures. It should be remembered also that it requires these mineral matters to be presented to it in the oxidized state. Thus, the oxygen and hydrogen are presented in the shape of water (H_2O), nitrogen in nitric acid (N_2O_5), and ammonia (NH_3), and carbon and oxygen as carbonic acid (CO_2). Through the agency of the sun the simple elements are recombined to form new compounds containing less oxygen. From the excretions and decay of the animal again result inorganic substances, water, carbonic acid, ammonia, sulphuretted and carburetted hydrogen, etc., which sustain the plant. Thus the plant recomposes, and the animal decomposes; the plant deoxidises, the animal oxidises.



The annexed diagram, from Professor Church's paper on "The Food of Plants,"* will serve to impress these facts, and the relations between the three kingdoms of nature. In it the cycle of changes is represented by the large circle, and the several spheres of chemical substances and chemical changes, mineral, vegetable, and animal, are indicated by smaller circles or epochs or stages on the system, with the sun in its center. From this is seen how mineral substances nourish the plant, being transformed into vegetable tissues; how the plant feeds the animal, and is transformed into its flesh and bones; "and how, as the last step in this perpetual circulation of matter, the animal after death relapses once more into purely inorganic compounds."

While these facts are true in general, so far as nature has been successfully studied, yet even these means of distinction are not always

* Popular Science Review, vol. vii. p. 56.

practically applicable, so that there is still a class of organized beings the exact position of which has not been precisely determined. To meet this, Professor Ernst Haeckel, of Jena, in his classification, makes a distinct group of intermediate or *first* beings, which he names neither animal nor vegetable, but PROTISTA.* Of these he makes in his last work the following eight classes:

I. The MONERA (*μονηρης*, simple), the simplest structureless non-nucleated masses of living matter,—“living particles of albumen, capable of nourishment and reproduction.”

II. AMOEBOIDA, or PROTOPLASTA (*πρωτος*, first; *πλασμα*, anything formed), including *amœbæ*: nucleated, but otherwise structureless, masses of living matter, with or without a contractile vesicle or vacuole, of which the *gymnamœbæ* (*γυμνος*, naked) are naked or without a cell wall, and the *lepanamœbæ* (*λεπιδας*, a scale or rind), furnished with a shell or test; 2. *gregarinæ*, simple sac-like structures, nucleated, which Haeckel believes to be *amœbæ* which have degenerated by parasitism. The possession of a nucleus and of a contractile vesicle forms the only distinction between the true *amœba* and *protamœba*, the simplest of the Monera.

III. FLAGELLATA (L. flagellum, a lash), simple nucleated unicellular bodies, possessing a vibratory lash or cilium. A familiar example is seen in the green englena, which in the spring of the year often colors quite green the water of pools, in which it sometimes swarms in immense numbers.

IV. CATALACTA (Magosphœra), a very wonderful new protiston, discovered by Haeckel in 1869, on the coast of Norway. It is an extremely beautiful little sphere, composed of a number (30 or 40) of ciliated pear-shaped cells, which are united with their sharp ends radiatingly in relation to the center of the sphere. After a certain time the ball breaks up. The individual cells float independently in the water, just as do certain ciliated infusoria. They finally sink to the bottom, withdraw their cilia into their bodies, and assume the form of the creeping *amœbæ*. The latter finally encapsulates itself, and subdivides into a number of cells by a process of segmentation. The cells cover themselves with cilia, break through the capsule again, and again float in the shape of a ciliated sphere. This wonderful organism, therefore, appears at one time as a simple *amœba*, again as a simple ciliated cell, and again as a many-celled ciliated ball. From its intermediate position among

* Haeckel, *Generelle Morphologie der organismen*. Erster Band: *Allgemeine anatomie*. Berlin, Geo. Reimer, 1866. *Natürliche Schöpfungsgeschichte*. Vierte verbesserte auflage. Berlin: Geo. Reimer. 1878. *Biologische Studien*. Erstes Heft: *Studien über Moneren und andere Protisten*. Leipzig, Wm. Engelmann, 1870.

other protista he calls it *der Vermittler* or *catalacta* (*καταλακτης*, a mediator).

V. LABYRINTHULÆ. No less mysterious, according to Haeckel, is the fifth group, first discovered by Cienkowski in sea-water. They are composed of spindle-shaped cells, for the most part yellow-colored, which sometimes unite themselves in dense masses and again move about in the most peculiar manner. They build, in some unexplained manner, a reticular framework of labyrinthically-interwoven threads. "According to form," says Haeckel, "we would regard the labyrinthulæ as the simplest plants, according to motion as the simplest animals. In fact they are neither animals nor plants."

VI. DIATOMACEÆ (*δια*, through; *τομος*, a cutting), usually described as nucleated unicellular plants, but also claimed by some naturalists for the animal kingdom. They are provided with an envelope or cell wall which subsequently acquires silicious deposits. The name is derived from a disposition these cells have to cleave or split into symmetrical halves.

VII. MYXOMYCETES (Mycetozoa) (*μυξα*, mucus; *μυκης, ητος*, a fungus); a family of fungoid nucleated spores parasitic upon decaying wood, bark, heaps of decaying leaves, tan beds, etc. Their peculiarity lies in this: that when the spores are placed in water, and protected from evaporation, their cell walls rupture and their contents escape in the shape of gymnocytoḗ or naked cells, or invested only by a thin primordial utricle. Each of these comes to possess, after several changes of form, one or two cilia, by which it executes movements of progression and rotation, and two or three vacuoles of which one at least pulsates (Carpenter). After a few days the cilia disappear, the cells acquire a larger size, and move like amœbæ in a creeping manner by protruding parts of the body. Later a net-work of protoplasmic threads is formed, similar to the sarcode net-work of the Rhizopoda,—a sort of mycelium which ultimately gives rise to fructification. Of them Haeckel says that next to the true Rhizopoda they stand nearest the Monera, the substantial difference being that the spore of the Myxomyceta always encloses a nucleus, and is therefore a true cell, while in the Monera nuclei are never present. There is also a further development of the Myxomyceta as described.

VIII. RHIZOPODA* (*ριζα*, a root; *πους, ποδος*, a foot), or "root-footed" animals, composed of a sarcode or protoplasmic body capable of extension into long processes called *pseudopodia* (false feet) which serve at once for organs of locomotion and as prehensile organs for obtaining food. These are also nucleated, and possess a distinct

* The *amœba* is not classed by Prof. Haeckel among *Rhizopoda*, where it is placed by Dr. Carpenter. The former speaks of the *amœba* as "rhizopod-like," and includes in the latter only *acytaria*, *heliozoa* and *radiolaria*.

shell membrane, and by this latter characteristic are distinguished from the protoplasta. Except the protomœba, they are nearest allied to *Monera*.*

Higher up in the scale, however, there are added to the animal certain well-marked characteristics which pre-eminently distinguish it from the vegetable, seen in the possession of a *nervous system* and the *functions* resulting therefrom,—*sensation, voluntary motion, mental and moral manifestations*, the last being probably peculiar to man, endowing him with those attributes to which may be said to be due his "*Humanity*,"—that is, the power of discriminating between right and wrong, a knowledge of the good, the true and the beautiful, and a capacity of conceiving the existence of a Supreme Being.

The following table from Edward L. Youmans's new "*Chemistry*" furnishes in a convenient form the distinguishing features which have been the subject of the foregoing remarks:

THE VEGETABLE	THE ANIMAL
1. Absorbs carbonic acid from the air.	Returns carbonic acid to the air.
2. Supplies oxygen to the atmosphere.	Withdraws oxygen from the atmosphere.
3. Decomposes carbonic acid, water, and ammoniacal salts.	Produces carbonic acid, water, and ammoniacal salts.
4. Produces the organic principles of food.	Consumes the organic principles of food.

* It is but proper to say that Haeckel was by no means the first to appreciate the difficulty of legitimately placing all organized beings in one of the two acknowledged kingdoms. For we have even Pliny, in *Natural History*, book ix. chap. 68 (text of Sillig: Gotha and Hamburg, 1851-3), writing, "*Equidem et his inesse sensum arbitror quæ neque animalium, neque fructuum, sed tertium quendam ex utroque naturam habent: urticis dico et spongiis.*" Buffon, in 1771, refers to the same kingdom; and M. de Saint Vincent, in 1824, in his *Dictionnaire Classique d'Histoire Naturelle*, calls it the *Regne Psychodiaire*; and Professor Owen, in his *Hunterian Lectures* in 1855, says, "There are very numerous living beings, especially those that retain the form of nucleated cells, which manifest the common organic characters, but without the superadditions of either kingdom. Such organisms are the *Diatomaceæ*, *Desmidiaceæ*, *Protococci*, etc." This class he clearly intends in his *Paleontology* (1860) to indicate by the word *Protozoa*, although it literally means *first animals*, and was therefore inappropriate. Mr. John Hogg, in the same year, in the *Edinburgh New Philosophical Journal*, new series, vol. xii., suggests *Regnum Primogenum* as a substitute for Owen's *Protozoa*, to indicate the same group. Finally, Dr. Thomas B. Wilson and Mr. John Cassin read a paper before the Academy of Natural Sciences of Philadelphia, May 26th, 1863, "*On a Third Kingdom of Organized Beings*," which is published in vol. xv. of the *Proceedings of the Academy*, in which the word *Primalia* is suggested for this third kingdom, in which they include the five sub-kingdoms *Algæ*, *Lichens*, *Fungi*, *Spongia*, *Conjugata*. To this very interesting paper I am indebted for the information contained in this note.

THE VEGETABLE

THE ANIMAL

- | | |
|--|--|
| 5. Endows mineral matter with the properties of life. | Deprives organic matter of the properties of life. |
| 6. Imparts to chemical atoms the property of combustibility. | Deprives chemical atoms of the property of combustibility. |
| 7. Imparts to chemical atoms the power of nourishing the animal. | Imparts to chemical atoms the power of nourishing the vegetable. |
| 8. Converts simple into complex compounds. | Converts complex into simple compounds. |
| 9. Is an apparatus of deoxidation. | Is an apparatus of oxidation. |
| 10. Is a mechanism of construction. | Is a mechanism of reduction. |
| 11. Absorbs heat and electricity. | Produces heat and electricity. |

(To be continued.)

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

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(Continued from page 625 of vol. xv.)

THE REGION OF THE EAR.

THE region of the ear presents two features for examination,—the *auricle* or *external ear* and the *post-auricular space*.

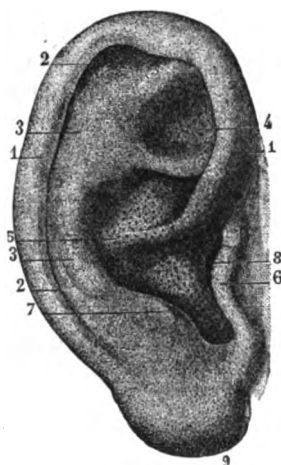
The connections of the *auricle* with the external meatus and thence with the middle ear are such that many conditions of the latter chamber may have clinical relations with the region under consideration. The same remark is true of the entire *pars tympanica* of the temporal bone, which in reality is part and parcel in structural unity with the external ear.

With respect to the *post-auricular space* we have always to remember its intimate relations with the mastoid cells,—the mere mention of the name of which is sufficient to indorse the grouping under one head the *post-auricular space* with the external ear. The *post-auricular space* in addition suggests independent occipital and cervical reciprocities.

The Auricle.—The *external ear*, or *auricle*, is an appendage to the side of the head, designed for the reception of waves of sound. It is of a sub-elliptical figure, and placed between two horizontal lines; one running backward from the eyebrow, the other backward from the level of the nostril. Its main axis is nearly vertical, and, at least in the male, parallel with the ascending ramus of the lower jaw. It is composed of an irregular, sculptured lamina of fibro-cartilage, to which is attached inferiorly a pendant of delicate fat termed the lobe, the whole structure being inclosed in skin. The lobe is often spoken of as a *pouch* containing fat and connective tissue; more properly it is a *fold of skin*, for a pouch implies an open sac or cavity, which the lobe

is not. The external ear presents for examination an anterior and posterior surface.

FIG. 7.



The following are the main points in the nomenclature of the external ear. An outer border termed the *helix* (1), beginning as a thin elevated central root (5), sharply limited above and in front, but becoming more obtuse along its outer border, and finally lost before reaching the lobe. Within the periphery of the helix is a second eminence, the *antihelix* (3). Starting below the root of the helix, it describes a shorter curve to terminate in two fork-like processes, the upper blunt, the lower sharp, which are lost behind the acute anterior border of the helix. The depression between the helix and antihelix is termed the *fossa of the helix* (2), that between the forks of the antihelix the *fossa of the antihelix* (4). The antihelix is continuous below with the *antitragus* (7), and thence through the line of the *intertragic notch* with the *tragus* (6). The space between the antihelix, antitragus, and tragus is called the *conch*, which is crossed along its floor by the root of the helix.

These names have been so long fixed to the several parts of the ear that it would be folly now to attempt to change them. It is needless to say that they have not been happily selected.

The following points in the general plan of an external ear may be worth considering. Every ear yields on examination three curves, which may be defined as the *curve of the helix*, the *curve of the lobe*, and the *curve of the conch*.

The curve of the helix begins at the *upper* margin of the root of the helix, and is continuous with the *inner* border of the helix. The curve of the lobe answers to the *outer* margin of the lobe, and

thence to the outer margin of the helix. These two curves pass and are lost in one another along the posterior border of the auricle. The curve of the conch begins at the *lower* margin of the root of the helix, can be traced thence along the border of the *tragus*, intertragic notch, antitragus and antihelix, and thence to the lower fork of its division below the fossa of the antihelix. The form resulting from the union of these three curves gives a true outline of the organ. It will be observed that the axis of the first curve is inclined a little upward and forward, and that of the second a little downward and forward. It follows that the produced axes of these two curves will intersect at about the axis of the root of the helix. The root of the helix, therefore, divides the auricle into two parts, an upper and lower. The upper is set at a greater angle to the side of the head than the lower, the angle representing, according to Gruber, 45° .

The *fibro-cartilage* of the auricle can for the most part be felt through the skin. Its depressions and elevations answer for the most part to those seen in the auricle as a whole. The eminence on the anterior surface answers to depressions on the posterior surface, and *vice versa*. The features of the fibro-cartilage not seen from without are the *cauda helix*, a tapering process of inconstant proportions which passes down into the base of the lobe of the ear, a small process answering to the external free margin of the helix, known as the *process or spine of the helix*, and the various slits or fissures which are inconspicuous in the body of the cartilage, but are well seen between the tragus and helix, and between the ring-like fissures of the conch (*fissuræ Santorini*) as it approaches the *pars tympanica*. Gruber* mentions a case in which the *cauda helix* passed some distance into the lobe. It had been perforated in the procedure of piercing the ear. Severe inflammation of the auricle supervened, which extended to the retro-maxillary space, where an abscess formed demanding active treatment.

The skin of the anterior surface of the auricle is held firmly to the perichondrium without the supervision of fat. This, according to Luschka, is to prevent any accidental accumulation of fat interfering with the reception of waves of sound. Fat is present in small quantity on the posterior surface of the auricle, where, towards its base, the skin is not firmly fixed to the perichondrium, although some authorities so affirm. In the ears of many healthy persons well-defined folds of skin extend from the post-auricular space to the hinder surface of the auricle. We have on a previous page stated the ease with which the posterior surface of the auricle be-

* Lehrbuch die Ohrenheilkunde, 1870-71.

comes swollen in erysipelas. Infiltration may occur in the sparse sub-dermic connective tissue here appreciable.

Kramer elaborates a distinct variety of inflammation of the auricle, which he would diagnose as follows:

"A slightly-painful tumor appears, equal in size to a hen's egg, which, however, does not open spontaneously. Fluctuation is very evident from the commencement. When opened, fluid, dark blood flows out, which collects again, requiring reopening and evacuation. In the sac fresh cartilage forms, which ultimately unites with the old cartilage with great disfigurement of the ear."

Ossifications of the cartilage are occasionally seen, not, however, as a result of advancing years so much as the effect, according to Garrod,* of gout. According to Toynbee† a similar deposit is seen in auricles following othæmatoma in the insane. The description of Kramer's inflammation of the cartilage would apply to those blood-tumors of the auricle, regarding the connection of which to any essential conditions of the nervous system grave doubts have been freely expressed.

The presence of a point or process upon the anterior border of the cartilage of the helix, "a little blunt point projecting from the inwardly-folded margin of the helix, variable in size and sometimes occurring in one ear and not in the other," has been recently attracting considerable attention, from the fact that Mr. Darwin‡ ascribes to it a peculiar significance, nothing less indeed than as constituting the rudiment of a structure which answers to the pointed ear of the lower animals. Lucæ§ would explain the appearance of this point by a much simpler process, viz., as the result of inter-uterine inflammation and pressure.

Dr. C. H. Burnett has lately published|| his convictions that the functions of the ensculpturings of the fibro-cartilage are of great value in preserving to the auditory sense the discrimination of musical tones.

The muscles of the auricle, both *intrinsic* and *extrinsic*, are of little or no importance, and we therefore omit description of them. It may be simply remarked, in passing, that the *retrahens aurem* would appear to belong to the occipital set of muscles, and to have little or nothing in common with the *attrahens* and *attollens aurem*.

The *arteries* of the auricle are derived from the external carotid, viz., from its auricular and sup.-temporal branches. It is an interesting fact that the branch of the post-auricular artery which passes to the front part of the auricle effects entrance from below through the fissure of fibro-

* Nature and Treatment of Gout, 1859.

† Tr. Path. Soc. Lond., 1860, xi. 225.

‡ Descent of Man, 1871, 22. § Virchow's Archiv, xxix. 62.

|| "The External Ear as a Synthetic Resonator," Phila. Med. Times, Oct. 4, 1878, p. 8.

cartilage between the helix and conch. Its veins empty into the external jugular,—small venules join the temporo-maxillary vein.

The nerves are derived from the superficial cervical plexus through the auricularis magnus, the auricular branch of the trifacial, and posteriorly from the facial nerve. Arnold's nerve, a branch of the pneumogastric, also sends a branch to the auricle. This—the last mentioned—is a feature of marked significance it has been thought in connection with the respiratory character of the mucous passages of the ear, and the fact that the position at which the nerve affects entrance into the temporal bone, namely, “at the outer border of the jugular foramen to an opening near the styloid process,” is the region corresponding to the first visceral cleft of the embryo.

The exact areas of distribution of the above nerves can sometimes be determined in paralysis of some of the branches.

The varieties in the form of the auricle are very numerous. The conformity between the ear and other features has not been made of the importance it would appear to deserve. It is certain that in questions of identity it may prove of value. Many instances have been given of the permanence of a given shape of the auricle as a family characteristic. According to Gruber (*loc. cit.*), Hoppe has observed a congenital deformity in the auricle in a Swiss family, which descended through many generations.

What we may term the generalized outline of the auricle, such as is seen in drawing-books and in anatomical figures, as, for example, that used in illustrating our pages, gives the student but a limited notion of the *portrait* of the ear as found in the living subject. The above figure might stand as a type of an ideal ear to which individual ears may conform, but few in reality do. As we speak of a classic or pure countenance we may speak of a classic or pure ear-form. We find evidences in studying the antique ear that close attention has been given to the conformation of the external shape to the idea which it was designed to convey through the shape. No one can doubt in comparing the ears of the classic head that the outlines were in every instance carefully harmonized with the other proportions. The ear of the Farnese Hercules, for example, is angular, and the eminences of the antihelix and antitragus exaggerated. In the Juno the curves are retained and emphasized, the lobe hanging like a jewel, in exact harmony with the treatment of the hair. In the Clytie the ear is as small and elegant as the other features of this exquisite head. In the ear of the Roman bust the attempt to preserve a portrait of this organ as well as of the countenance is very apparent. A curious contrast between an antique ear and the modern one is seen in the statue of the gladiator. The right ear is lost in the original of this statue, and has been restored by an Italian sculptor. But the artist, neglecting to preserve an equa-

tion between the antique ear and its modern fellow, has given us, as an opposite to the compressed, solid ear demanded by the crisp, short hair characteristic of the gladiatorial (*i.e.* pugilistic) head, an out-of-door realism as commonplace as the mind of the man who carved it.

The varieties of the lobes of the ear are very curious. It is usually pendulous, with a free anterior border. Occasionally it is without this border, when the lobe appears confluent with the lines of the face and neck. Some of the members of the Cabinos tribe of Indians, inhabiting the valley of the Amazon, possess lobes to their ears of enormous proportions, if we are to credit the account of Marcoy,* according to which they reach the shoulders, and are bifid nearly their entire length. The large ear with long lobe is often seen in Buddhistic idols, and is doubtless regarded by the votaries as an object of beauty.

According to Laycock,† the lobe of the ear is confluent in melancholia and absent in dementia. Dr. L. V. Dodge, Assistant Physician to the Insane Department of the Philadelphia Hospital, has kindly examined the ears of the inmates of that institution, with a view of determining the frequency of occurrence of such peculiarity. Out of one thousand and twenty-five patients examined, but one hundred and eighty-four exhibited the confluent lobe. What Laycock calls the "absent" lobe is to be included in this number. When it is remembered that a large proportion of our insane are sufferers from dementia and melancholia, it will be seen that Laycock's statement has not been confirmed. It is a curious fact that of the one hundred and eighty-four ears marked by the confluent lobe, one hundred and fourteen were from females.

It has been asserted that there is a difference between the ear of the male and female; that the axis of the male ear answers to that of the ascending ramus of the lower jaw, or to a line running parallel with it. The axis of the female ear, on the other hand, responds to the produced curve formed by the lower jaw with the neck. From our own observation, the ear of the young female is less inclined than that of the male.

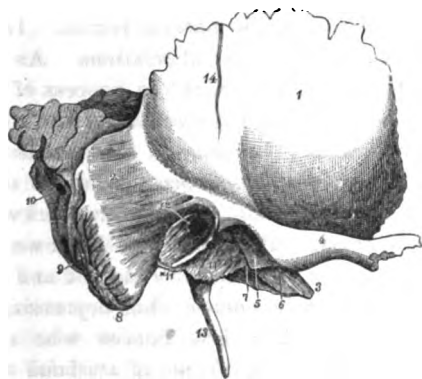
The Post-Auricular Space.—The relations have been sufficiently suggested at the beginning of this paper to require no extended recital in this place. The locality is really defined in the name. Below it extends upon the neck, above it is lost within the scalp. The skin covering it is smooth, and between it and the mastoid portion of the temporal bone is a sparse connective tissue containing a few lymphatic glands, and crossed by minute vessels and branches of the second occipital nerve, and according to Hirschfield, a "mastoid, or second small occipital nerve."

* Voyage à travers l'Amerique du Sud de l'Océan Pacifique à l'Océan Atlantique, vol. ii. 13, Paris, 1869.

† "Physiognomy in Mental Disease," Medical Times and Gazette, 1862.

The mastoid process, from its important relations with the occiput, yields points of interest with the post-cervical muscles, notably the splenius and trachelo-mastoid. An aponeurotic slip from the sterno-cleido-mastoid muscle passes upward over the root of the process

FIG. 8.



EXTERNAL VIEW OF THE TEMPORAL BONE OF THE RIGHT SIDE.—1, squamous portion; 2, mastoid portion; 3, apex of the petrous portion; 4, zygomatic process; 5, glenoid cavity; 6, glenoid tubercle; 7, glenoid fissure; 8, mastoid process; 9, back part of digastric groove; 10, mastoid foramen; 11, auditory process, by extension inwardly, forming the vaginal process; 12, external auditory meatus; 13, styloid process; 14, slight impression of the deep temporal artery.

externally. The deeper parts about the mastoid process belong to the base of the skull, and are thus manifestly excluded from the space under consideration.

Engorgement of the lymphatic glands here situated is not infrequently seen in cases of diseases of the external auditory meatus.

When inflammation of the mastoid cells exists there is usually brawniness of the integument of the post-auricular space, and always tenderness on pressure. Very rarely the pus may effect an outlet through the mastoid foramen, which as is known is of variable size, and sometimes may aid the jugular foramen in carrying venous blood *from* the lateral sinus. Dr. F. Buszard* gives an interesting account of a case of this kind. The patient, after suffering for eleven months, during the latter part of which time drowsiness and vomiting were symptoms, submitted to an operation in which the bone was trephined over the position of the foramen. An ounce of viscid pus escaped, and the patient made a good recovery.

The writer has seen two cases of encephaloid disease of the post-auricular space, one of which had been mistaken by experienced surgeons for caries of the temporal bone. The glandular involvement in

* Brit. Med. Journ., 1871, 89.

both cases was strikingly exhibited. In one of these the outer border of the auricle and the lobe escaped the otherwise complete destruction of the auricle. Inflammatory trismus and dysphagia were in both cases conspicuous symptoms.

Wilde* mentions a case of aneurism of the post-auricular artery.

The external auditory canal, as already mentioned, may become the outlet of a collection of pus in the parotid region. In another way it may be involved in a question of facial relations. As will hereafter be mentioned at greater length, the condyloid process of the lower jaw is in intimate relation with the *pars tympanica* of the temporal bone and the external auditory canal. In some of the conditions of the lower jaw in edentulous old people this process tends to slip a little backward, and helps to close the canal from before backwards. Deafness may arise from this cause. This fact is well known to aurists, who, in introducing the speculum into the ear of an old and toothless person, may request that the mouth be opened, thus depressing the jaw, if any difficulty be encountered. The first dentist who appears to have noticed the beneficial effect of a full set of artificial teeth in relieving deafness arising from this cause, was Mr. Jacob Gilliams,† of Philadelphia.

(To be continued.)

A LECTURE ON THE TRUE NATURE AND ORIGIN OF THE SALIVARY GLOBULES, AND THEIR IDENTITY WITH THE WHITE CORPUSCLES OF THE BLOOD.

BY JOS. G. RICHARDSON, M.D.,

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(Delivered before the Odontographic Society of Pennsylvania, Nov. 5th, and before the Pennsylvania Association of Dental Surgeons, Dec. 9th, 1873.)

THE human mind, under conditions of culture and refinement, discovers few more agreeable occupations in the various departments of that greatest of all means of happiness, *the exercise of power*, than in exploring the mysteries of natural phenomena, and unveiling the hidden structure and constitution possessed by the innumerable objects which surround us in the world.

This desire for investigating the secrets of creation, like certain other less satisfying passions, grows with what it feeds upon, and I therefore venture to hope that your attachment to the school of seekers after truth in nature will lead you to feel an interest this evening in my remarks upon the true structure and origin of the salivary globules, and their identity with the white corpuscles of the blood; particularly

* Treatise on Diseases of the Ear, 175.

† Mütter's Liston, 304.

as these researches have a direct bearing upon some of the knotty problems in your own specialty of medicine.

The nature of the nucleated corpuscles so abundant in the saliva has long been a subject of some uncertainty; and although they have, no doubt, as favorite test-objects for the higher powers of the microscope, been more frequently examined by microscopists than almost any other constituent of the glandular secretions, observers seem to have been generally contented to accept them simply as useful measures for the capacity of the higher objectives, and passed on without attempts to solve the enigma of their origin.

The celebrated German histologist Kölliker has indeed advanced the theory that they are essentially a form of exudation-corpuscles, but his hypothesis does not appear to have been accepted by microscopists generally as a fixed fact; for, although Messrs. Griffith and Henfry, the able authors of the *Micrographic Dictionary*, published in London, 1860, remark that this view (of Kölliker) is probably correct, for they may occur in the secretion of any mucous surface, and have no special connection with the salivary glands, Prof. Lionel Beale, writing in 1867, observes: "The examination of the saliva presents no difficulty. The fluid is perfectly transparent and viscid, but holds in suspension, besides epithelium from the mouth, a number of small cells, for the most part of an oval or spherical form, which are probably derived from the ducts of the gland. They are about one-two-thousandth of an inch in diameter, and are sometimes called 'salivary corpuscles.' In some cases they accumulate in great number, and closely resemble pus-corpuscles. Some observers consider them to be altered epithelium from the cavity of the mouth; but this can hardly be the case, as they are often met with in the absence of any of the characteristic cells of scaly epithelium. They are found in great number in cases of salivation. In the somewhat viscid matter of which the salivary corpuscle is composed are multitudes of highly refractive particles, in incessant motion. The nature of these particles is extremely doubtful. They look very like the germs of Bacteria, and it is possible they may be of this nature."

According to my own observations, first published in the *Pennsylvania Hospital Reports* for 1869, "The salivary corpuscles prepared for examination (by merely placing a drop of saliva on a slide, covering it with a very thin glass), and observed under a power of eleven hundred diameters, present the appearance of perfect spheres, varying from $\frac{1}{1400}$ to $\frac{1}{2000}$ of an inch in diameter, each having a very transparent but beautifully-defined cell wall of exceeding tenuity, which incloses from one to four almost equally transparent nuclei (of a circular or oval form), whose diameters range from $\frac{1}{2000}$ to $\frac{1}{4000}$ of an inch or even less. These nuclei are situated sometimes centrally, but

more commonly near one side of the corpuscle, and the cavity between their margin and the cell wall is generally filled with from twenty-five to fifty molecules not more than $\frac{1}{1000}$ of an inch in diameter, whose characteristic is that of constant and rapid motion. Some of these molecules seem to be elongated into an oval or hour-glass form, but the activity of their movements renders it difficult to ascertain this with precision. In my observations the corpuscles themselves have appeared to enlarge and become flattened from the pressure of the glass cover, as the stratum of liquid beneath it grew thinner from marginal desiccation, so that usually in the course of an hour or so they burst and discharge one-fourth (or more) of their contents, when two, three, or more of the molecules swim away, continuing their revolving movements until they pass out of view; the other granules outside, and these remaining within the cell, become in a very few seconds entirely stationary. If a solution of aniline red, of the strength of one grain to the ounce of distilled water, be allowed to penetrate at the margin of the cover, the nuclei of the salivary corpuscles are readily stained of a bright crimson, and are thus exhibited with beautiful distinctness. The dye appears, however, to exert an immediate influence upon the movement of the molecules, as I have rarely been able to find cells in which these continued to move after the nuclei became at all colored."

Before proceeding to narrate the curious accident which led me to the discovery which forms the main subject of my lecture, I think it will be interesting to you for me to quote some remarks of Prof. Kölliker, as showing how nearly a man of great genius may approach the truth and yet fail to grasp it, through being withheld by the influence of some false general doctrine: in this case, the erroneous dogma of an essential difference between the pus- and white blood-corpuscles.

The salivary or mucous corpuscles, says he, are "rounded, of 0.005 of a line in diameter, with one or many nuclei, always to be met with in the fluid of the mouth, and usually supposed to be derived from the mucous or salivary glands, yet wrongly, since the examination of both these kinds of glands and of their ducts teaches us that they excrete no formed elements. In my opinion," continues he, "these corpuscles are nothing but products of the mucous membrane of the oral cavity; not normal, although they are almost constant; but a kind of exudation- or pus-corpuscles, with which they have, as is well known, the closest possible resemblance in structure. Many authors consider them to be abortive epithelial cells of the oral cavity; but if that were true, the epithelium of the localities in which they are found must want the outermost layer of large flattened scales, *which is by no means the case*. In my own person, at any rate, I find these mucous corpuscles on the gums, lips, cheeks, and tongue, in localities in which the epithelium is wholly uninjured; and by scraping with a knife I can often

obtain entire lamellæ of epithelial plates, covered with mucous corpuscles. I do not mean to affirm by this" (and here I beg you to notice, gentlemen, how K  lliker retreats from the verge of the important discovery near which he has strayed, driven back by the false doctrine that a peculiar exudation gives rise to distinctive pus-corpuscles),—"I do not mean to affirm by this," he says, "that in little sores arising from whatever cause, upon the gum, for instance, where the epithelium is wholly or partly wanting, or when it is lost more extensively in consequence of disease, that mucous or exudation-corpuscles may not be developed as upon other sore surfaces, and these might be regarded as abortive epithelium cells, but only that this does not take place in the oral cavity under ordinary circumstances. I consider, therefore, that the so-called mucous or salivary corpuscles are exudation-corpuscles, and consequently totally distinct from epithelial cells, and I regard their formation to be analogous to that of pus-corpuscles in catarrh, which also very often takes place upon unbroken epithelial surfaces. It is thus readily explained how it is that they are almost entirely absent in many individuals, while in others who are subject to irritation of the mucous membrane of the mouth they are very abundant; likewise we may see how it is that they have been observed in saliva obtained from a fistulous aperture."

The circumstance already alluded to, as conducting me to what I believe to be a correct view respecting the origin of the salivary globules, was as follows: In examining some of the renal secretion obtained on the 8th of August, 1868, near my former residence in western New York, from a patient who complained of severe pain in the kidneys and bladder, I was surprised to find that a deposit which appeared to the naked eye purulent was chiefly composed of cells exactly resembling in form, size, definite cell wall, contained nuclei, and actively-revolving molecules, the salivary corpuscles with which by frequent observation I had become so familiar; and should have imagined that these proceeded from an accidental adulteration with sputum, had I not been fortunate enough to have ocular demonstration to the contrary when procuring the specimen. I examined these corpuscles repeatedly in the course of the two following days, during which the movements of the molecules continued, but could make nothing else of them except drawings, which were carefully preserved.

Numerous investigations of specimens from a great variety of cases, during the succeeding months, failed to reveal any more of these globules for which I was so eagerly searching; but in December of the same year I met with them again in the renal secretion from another case of cystitis; and a few days afterwards, whilst examining another sample from a patient affected with the same disease, observing that some of the pus-cells it contained had a spherical outline, were almost

opaque, and only about $\frac{1}{3000}$ of an inch in diameter, it suddenly occurred to me that they were perhaps merely contracted by the exosmose of their fluid contents into the surrounding denser medium, and the idea suggested itself to me to try the effect of diminishing the specific gravity of the urine by the addition of water. Under this treatment I found that the cells of the pus, which had been exhibiting amœboid movements, soon assumed a spherical shape, rapidly enlarged until they reached the diameter of about $\frac{1}{1700}$ of an inch, when the contained molecules began to revolve, and ere long took upon themselves the extremely rapid and confused movement which I had twice before seen in similar cells deposited from the renal secretion, and hundreds of times in the salivary globules. The action of aniline solution resulted in rendering visible beautifully distinct, definite nuclei, analogous to those found in the salivary bodies.

About this time, as many of you will remember, appeared the announcement of Prof. Cohnheim's remarkable researches, establishing the identity of white blood- and pus-corpuscles in the frog; and the opportunity of at least partly corroborating them in regard to human beings thus obviously presenting itself, I contrived the following experiments for that purpose:

Drawing a drop of blood from the tip of my finger (by puncture with a cataract-needle) upon a glass slide, to which was attached a small reservoir composed of the lower half of a two-drachm vial, I covered it with thin glass, and placed it upon the stage of the microscope. After finding a white blood-corpuscle showing well-marked granules and well-characterized amœboid movements, I raised the objective out of the way, and arranged a fine filament of thread to act as a syphon from the little reservoir (previously filled with fresh water) to the upper edge of the cover, and a fragment of moistened paper to the lower, according to the usual method of securing a constant current beneath the thin glass. On depressing the body of the instrument, and thus bringing the corpuscle again into view, I found it still adhering to the under surface of the cover, notwithstanding the torrent of red globules hurrying across the field; and as these became paler and less distinct through exosmosis of their colored contents by reason of the diminished density of the serum (which of course was all the time being diluted by the water conveyed to it by the miniature syphon), the white cell first gradually expanded, and displayed its delicate wall, with two rounded nuclei; then, after acquiring the magnitude of $\frac{1}{1700}$ of an inch, it exhibited the rapid and incessant movement of its contained molecules; and finally, when its diameter reached about $\frac{1}{1400}$ of an inch, it burst suddenly, discharging a portion of its contents, whose outbreak resembled that of a swarm of bees from a hive, and some particles of which, actively revolving as they went, swam off to the confines of the

microscopic field. On repeating the observation, and allowing some aniline solution to flow in with the water, after the first few minutes the nuclei were strongly stained and rendered beautifully distinct, although the movement of the molecules promptly ceased; in this respect, as in all others, showing, so far as observed, a precise identity with the reaction afforded by the pus and the salivary corpuscles, as already described.

This investigation can be very readily repeated by any one who possesses a microscope and a good $\frac{1}{10}$, or even $\frac{1}{8}$ inch immersion objective; and as it is the turning point upon which, supported by other researches, my doctrine of the salivary corpuscle rests, I am very anxious that all of you who have time and opportunity will test the correctness of my description of the phenomena it reveals, by actual observation; and I would here remark that if any of my auditors finds a difficulty in carrying out these suggestions, or arrives at conclusions at variance with mine, I hope he will give me an opportunity to go over the process with him, and endeavor to demonstrate that absolute truth in regard to the matter for which I believe we are all seeking, as far as possible without prejudice and without fear.

Assuming now, for the sake of the argument, that the facts detailed above, and which I again beg you will examine for yourselves, concerning the changes occurring in white blood-corpuscles, or, as I prefer to call them, leucocytes, when immersed in a fluid of the low specific gravity of the saliva, are correctly stated, it is obvious that they afford ground for a strong presumption that these leucocytes, which we know are always circulating by tens, of thousands in blood-vessels which ramify within one-fiftieth of an inch of the free surface of the mucous membrane lining our mouths, do escape in some mysterious way from the vessels, and enter the oral cavity, where the saliva distends them in the same manner that water does in our experiment; further, that when thus enlarged, they constitute the salivary globules without other alteration than that of magnitude, their identity remaining undisturbed, just as a patient who becomes dropsical continues to be the same individual after the most profuse effusion which his skin will contain takes place, even although his body and limbs are rendered double their normal size, and their normal movements are impeded or annulled.

In order to establish such presumption of the identity of the dropsical and non-dropsical leucocytes into a fact, I must, however, ask your attention to a brief account of the nature of this latter important histological element (upon which I had the honor to report to the American Medical Association at its meeting in this city last year), and also to the vital part it performs in the inflammatory process.

If we attempt to penetrate the mysterious phenomena displayed in

the early stages of embryonic life, we find, as I need scarcely remind you, that the first change which occurs in the impregnated ovum of all animals is, to quote from Dr. H. C. Chapman's excellent "*Evolution of Life*," that the globular vitellus or yolk "divides into two segments, each segment having a nucleus with its nucleolus. These two segments subdivide into four balls, the four into eight, the eight into sixteen, and so on. Through this process of cell-division, or segmentation as it is called, the vitellus is divided into a number of little balls, and assumes the shape of a mulberry. Finally the superficial balls of the mulberry are transformed into cells, and so arrange themselves as to present the appearance of a mosaic pavement; as the deeper balls become cells they pass to the surface, and increase the thickness of this mosaic-like membrane. In this way the vitellus is converted into a vesicle; within this vesicle there shortly appears a second vesicle; (the walls of) these two vesicles are usually called the germinal layers, or the external and internal blastodermic membranes." Between these two soon after develops another stratum of cells, called the middle blastodermic layer or hæmoblast, because it is the source of the blood and vascular apparatus.

Now gentlemen, the small round cells, which in uninterrupted accumulation form in the impregnated ovum the germinal disk and germinal area, at a little later period constitute the external, middle, and internal blastodermic membranes, and still later differentiate into the blood and its vessels, are on the one hand thus the progenitors of the white corpuscles or leucocytes of the blood, concerning which I shall have so much to say to you, and on the other most closely resemble these same white blood-corpuscles, and likewise the cells of inflammatory lymph (the reparative material provided by nature for the healing-up of wounds) and the corpuscles of freshly-formed pus, all of these morphological elements being typical examples of that active protoplasm which Prof. Huxley has rendered so famous, under the title of "the physical basis of life."

Hence you perceive, I doubt not, the great importance of a complete knowledge, as far as possible, of these cellular elements, not only for my present purpose of proving to you the identity of leucocytes generally with the salivary globules, but also to our studies as anatomists, physiologists, and embryologists; and you are therefore prepared, I trust, to follow me into an investigation of their minute structure and physical properties, as most conveniently displayed for examination, in the white corpuscles of the blood. If you puncture the ball of your finger with a quick stab of a cataract- or ordinary sewing-needle, press out a small drop of blood the size of a yellow mustard-seed, touch the middle of a glass slide to this drop as it projects from the surface of the finger, and then lay the ensanguined spot of the slide gently upon a

thin glass cover, which has been carefully cleansed, you will have on inverting it a specimen suitably prepared for the examination of the leucocytes of blood.

(To be continued.)

FRAGMENTARY CLIPPINGS.

BY S. P. CUTLER, M.D., D.D.S., MEMPHIS, TENN.

IN the *Dental Register* of December, 1872, page 504, in a report on dental chemistry, the writer, speaking of chloride of zinc, says, "This is a powerful caustic, very complicated in its action, as it produces antiseptic, disinfectant, and escharotic results. If applied in substance it produces considerable pain on account of its great affinity for water. Therefore it is better to use an ethereal or chloroform solution, as they will supply it with water, and some benefit is derived from the local anæsthetic effect from the ether or chloroform."

This is all very good, only I would ask how the water is obtained from these agents, when neither of them contain water or have any affinity for water?

On page 526 the writer says, "I know by actual test that the saliva contains both sulphuric and lactic acid. Have seen in typhoid fever the saliva so vitiated as to soften the entire enamel surface. Three out of every four cases tested give acid reactions. The brown varieties of decay are due to sulphuric, the white to nitric, acid. These are generated in the mouth. In gout and rheumatism, lactic acid is always present in the saliva, generated elsewhere in the system."

In the above statements concerning the different varieties of decay, the writer simply reiterates the ideas of another, without giving credit for the same, with whom I took issue a couple of years back. The statements, whether true or not, remain unproven. How often do we see whole sets of teeth attacked with white decay from the use of muriated tincture of iron?

In the March number of the *Missouri Dental Journal* there is an article entitled "Reveries in a Dental Chair," in which there is a great deal of good sense, good hits, and to the point. I am with said correspondent in relation to all this rubber damming. I for one am an uncompromising opponent of it as a rule. There are exceptional cases in which the operation cannot be successfully performed without it. How did Badger, Chapin, Harris, and many others, unrivalled operators long before any such contrivance was invented, manage to do such work as they did, which to-day may be found in multitudes of mouths, as perfect as the day it was done? I cannot say that our best operators to-day with their rubber dam do any better fillings than those

pioneers above named, and hosts of others of more recent date, did, and are doing now, without the rubber dam. I know many that I regard as first-rate operators, who never use the dam. So much tedious preparation to fill a small, simple cavity, seems to me entirely unnecessary, and is no doubt one great cause why so many allow their teeth to decay. I have seen dentists spend more time in adjusting the dam, in order to fill in the most approved manner, according to the *code*, than was required to fill the tooth. It appeared to me entirely unnecessary; a little bibulous paper and a napkin would have filled the entire bill.

Let us put ourselves in our patient's place. Would we like our mouth to be kept open for hours, with a sheet of bad-smelling-rubber around a number of our teeth during the process of excavating and filling? I for one certainly would not. What I would not like done unto me, I would not like to do unto others.

The correspondent's idea about wedging is also a home-thrust at our *heroes* in this special practice. Here again let us put ourselves in our patient's place, and think how we would like to have our teeth driven apart to make room to operate in, whether done with the mallet at once, or by slow torturing degrees.

In the *Missouri Dental Journal* for January, 1873, page 20, the writer says he replaced a central incisor that had been knocked out the night before and had lain on the sidewalk over night, being more or less dried up, though it was a wet night.

What seems to me to have been rather contrary to sound practice, was the cutting off nearly an eighth of an inch of the point of the root. Although the case was pronounced a success up to the time of writing, there can be no great certainty of final results. I would simply ask how the root was benefitted by excising, and what is its present relationship to the socket?

In the same journal for April, page 129, the correspondent writing of labor-saving machines, the burring engines, etc., and improvements in materials to facilitate work and save time, speaks of the crystalline form of gold, and its effects on dental fees. I would simply ask if the writer wishes to be understood that the crystalline form of gold, if rightly manipulated, can be introduced any quicker or cheaper into a cavity than soft foil, or even adhesive foil?

I confess that I have almost discarded the use of crystal gold, on account of the time it requires to make a reliable filling, as anything short of perfection in its manipulation is a failure so far as my observation goes; and I have the same reports from others.

In the January number of the *Missouri Dental Journal*, 1873, page 15, there is a paper entitled "Anæsthesia," on which I desire to make a few remarks.

The article is rather a criticism of a paper under the same heading

(in the November number of the same journal), read before the Brooklyn Dental Society.

There are some points in the review I wish to notice. Speaking of chemical affinity, cohesive attraction, and gravity, the writer treats of them as a unit, without explaining the difference those forces express under different circumstances. He also regards chemical combinations and mixtures as the same thing, and rather ridicules the idea of making any distinction, and thinks all such ideas will soon share the fate of "latent caloric and phlogiston, etc." He does not advance any logical arguments to nullify those of the writer whom he reviews, and his assertions have not convinced the mind of the writer of this article.

He considers a mixture and a chemical combination in round numbers identical. I doubt if he can find any respectable authority to sustain his position.

He regards the combination in the atmosphere and in water as identical, ridiculing the idea of the first writer, and says, "A fish might join issue with him on this point." Would he have us believe that fishes breathe oxygen obtained by the decomposition of water by their gills? Carpenter says, "But it is requisite that they should possess the means of rapidly and constantly propelling large streams of water over their surface (*i.e.* gills) and of forcing the whole blood of the system through the respiratory apparatus, to be submitted to the action of the air, that is contained so scantily in the water."

On page 16 he says, "Now, the writer of the paper referred to lays great stress upon the assertion that the oxygen of the air is free. If the above be true, then this assertion must be fallacious. Does the oxygen in air have greater freedom than in nitrous oxide?" Not at all; on the contrary, the oxygen in nitrous oxide unites with carbon nearly as readily as pure oxygen, or, as Attfield expresses it, "it (nitrous oxide) supports combustion almost as oxygen;" and then he says, "Does any one suppose that the oxidation of anything will take place less rapidly in nitrous oxide than in common air?"

We know that combustion does take place more rapidly in nitrous oxide gas than in common air; but we must bear in mind at the same time that combustion of burning carbon and hydrogen takes place at the temperature of incandescence, or about 1000° of heat, and combustion or oxidation in the human body at about 98° or 100° ; hence we notice that the dynamic disturbance in the one case is about nine times greater than in the other. Such facts should be taken into account in rendering a verdict in the premises.

At the temperature of incandescence, the disturbance is so great that the quiescence of the nitrous oxide gas is readily overcome by the new force acting with more energy than the force holding the molecules of the gas together, and new alliances are formed where affinities are stronger,

i.e. between the oxygen of the broken-up gas and the carbon and hydrogen of a burning candle. The wick even rekindles, as in pure oxygen, from the fact that the spark on the wick is still incandescent; though only a spark, still it has that temperature. At this high temperature, the nitrogen, having no affinity for the oxygen, readily leaves, and combines with anything it prefers, if in contact, and even, at that temperature, without the presence of any other stronger affinities. I believe the gas is decomposed and remains then only in a state of mixture. This last is not stated as dictum.

My experiments with fresh meat immersed in gas and in air show that the meat is tainted more extensively in air than in gas, and much sooner at a temperature of summer heat, which fact shows conclusively that oxidation does not as readily take place in the gas as in air at ordinary temperatures.

The above facts are conclusive to my mind. We know that pure oxygen does not produce anæsthesia when breathed, and we know that oxidation of any and all things that are oxidisable at all takes place in it more rapidly than in nitrous oxide gas, or in common air at ordinary temperatures. Notwithstanding pure oxygen when breathed produces much more rapid oxidation and waste than common air, we do not witness this blueness, as is seen when gas is breathed.

The writer has not told us what is the difference, if any exists, between a mixture and a chemical compound, but leaves us to infer that they are the same thing. Now the writer knows full well that, chemically, bodies unite in certain definite volumes, measures, or weights, and not by any and all proportions. When certain equivalents of any two or more bodies unite under certain conditions and circumstances, certain other equivalent proportions may unite under certain other circumstances, but never heterogeneously, as in cases of mixtures which take place regardless of equivalency, and in every conceivable proportion.

We know full well that oxygen and nitrogen in the proportions of the atmosphere never chemically combine, and we further know that nitrous oxide gas is the most stable of all compounds of these two gases; and in fact any similar compound with but one equivalent of each element is more stable and resistant, *as a rule*, than when more equivalents of one or both exist.

We know that gases will mix in any and all proportions (with few exceptions), as water and alcohol.

It is also now understood that mixtures, in some or in all cases, have certain molecular affinities that overcome the force of gravity; otherwise the heavier gases or liquids would always precipitate and occupy the lowest level, while the lighter would occupy the higher level, which is the case to a certain extent only.

This same principle is often taken advantage of in the collecting of

gases by displacement, i.e. in case of chlorine, hydrogen, and some other gases. The choke-damp of old wells and cellars, where there are no currents of air to diffuse the gases, are familiar examples.

The same law to a certain extent applies to liquids and metallic alloys when melted, where the chemical affinities are not strong. In such cases gravity is more potent than electric molecular affinities, when left undisturbed.

Not so, however, in true chemical compounds; the order is reversed.

In the great aerial ocean, we have, besides nitrogen and oxygen (which are more abundant than all other gases), carbonic acid and watery vapor in constantly varying quantities, besides many other adventitious vapors or gases that may chance to escape from the earth during chemical changes, and possibly from meteors also. We know also that the proportion of oxygen fluctuates, constantly varying as oxidation may be taking place to a greater extent at one point than at others. The amount removed by oxidation, as in respiration, decay, and combustion, varies, and the amount returned to the atmosphere by vegetable growth also equally varies at different points and seasons of the year.

From the above facts we must necessarily conclude that the atmosphere is a great heterogeneous mixture only, and not a chemical compound at all.

The function of respiration is in exact accordance and harmony with the physical constitution of the atmospherical elements, and not in accordance with nitrous oxide gas or any other compound devised by any human agency; this fact must be conceded by all.

If we mix oxygen and hydrogen gases, they will remain as such until ignited, when water is instantaneously formed—a chemical compound neither combustible nor a supporter of combustion, and with a reduction in volume of nearly 2000 times.

Oxygen and carbon chemically combine with a reduction in volume of one-third. This compound, like water, is neither combustible nor a supporter of combustion, but, like water, an extinguisher of combustion.

When oxygen combines with iron and other metals, something very different from either element results. When heated to redness, iron combines direct with oxygen; also, when iron is moistened with water, the oxygen of the water combines with the iron, and hydrogen gas is set free. All these are striking examples of chemical affinities.

In the May number of the *American Journal of Dental Science*, page 14, in an article upon the predisposing causes of dental caries, the writer says,—

“If the mother does not ingest sufficient mineral substances in her food to nourish and build up the bones and teeth of her child, whether ‘in utero’ or at the breast, a portion of her own supplies will be extracted from the osseous tissues for this purpose; and here may be as-

signed one of the principal reasons why mothers suffer so much from dental decay and toothache. That salts are furnished the child which are abstracted from the mother's tissues, is said to be proven by the greatly diminished amount of effete salts excreted by a nursing mother, who is not receiving ingesta in sufficient quantity.

"Effete lime salts are cast out of the body, chiefly in the urine, by those even undergoing the process of starvation. The retention of them would seem to be demanded, if consistent with physiological harmony, but nothing short of the demands of a new being seems to command their retention or conversion into vitalized factors of nutrition."

Ideas similar to the above have been advanced before in dental journals, for the enlightenment of the dental profession, and it is a very important department of dental inquiry.

That *enceinte* females are specially liable to dental caries and toothache, there can be no doubt; observation proves this fact. Still I must beg leave to differ from the writer somewhat. I admit that teeth do decay rapidly in many cases of pregnancy, both in high and in low life, and under widely different conditions, but the question arises whether from the causes named? None of the animal creation suffer in this way that I am aware of; neither ought women, unless from hygienic transgression somewhere. No matter how highly the female may be fed during the stage of gestation with mineral elements contained in her food, where there are tendencies to caries it will make greater progress during this stage than at any other time, not excepting the lactiferous stage.

Let any one test the saliva of the *enceinte* female when her teeth show unusual indications of caries, and he will find that it will turn blue litmus red, showing acid reaction.

This acid is sufficient to decompose the tribasic phosphate of lime by removal of one equivalent of lime, leaving a bibasic phosphate, a soluble salt, which easily washes away in the saliva. It is no longer an organic salt of lime. How, then, could phosphoric acid again combine with this disintegrated lime,—either the equivalent taken out by the oral acid, or the equivalents of the bibasic lime left?

Such chemical changes do not take place backwards and forwards by accident, as no chemical change can be brought about without stronger affinities being brought to bear than the existing ones. Furthermore, such decomposed tribasic phosphate is no longer an organic compound, and we have no proof that it can ever become such outside of vegetable growth, when it is a living factor, and not a dead one, *so called*, as it must be when disorganized in the decaying tooth. The bibasic phosphate cannot be regarded an organic salt, any more than ordinary carbonate of lime rocks.

The writer says that the mother's osseous system has to be drawn upon in case of absence of the minerals in food.

How is it with the Esquimaux in Greenland, who subsist chiefly on train-oil and blubber, and who have good teeth so far as I know?—also the Chinaman and Hindoo, who live chiefly on rice, which contains but little mineral,—chiefly starch? Their women I believe have good teeth.

PROCEEDINGS OF DENTAL SOCIETIES.

ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED BY E. L. HEWITT, D.D.S.

A MEETING of the society was held at the Philadelphia Dental College, No. 108 N. 10th Street, Wednesday evening, September 3d, 1873.

Dr. Wm. A. Breen in the chair.

Dr. Wm. H. Gates was elected an active member. No essay being presented, the meeting assumed a discussional character.

Dr. McQuillen said a lady passing the summer season at Newport, R. I., had the misfortune to break off the outer cusp of the left upper first bicuspid, the fracture extending above the gum. She called on Dr. Smith, of that city, for the purpose of having what remained extracted. The doctor objected to the operation, as he thought the portion broken off could be restored with gold, and prove of service for some time to come. Placing in the cavity a temporary filling of gutta-percha, he advised the patient to call on me on her return to Philadelphia. On examination I found that the proximal surfaces had been filled, but decay had undermined the operations, and all that remained of the crown was a thin shell of the inner cusp. I propose to build up the tooth to its original shape, and shall avail myself of gold screws; placing two of them in the roots for the purpose of giving additional strength and support to the golden crown.* I have confidence in this class of work when it is demanded, and recall several successful cases, one in particular that has stood the test of eight or nine years' use, and is to this day in as perfect a condition as when the operation was performed. I feel the more interested in the subject and this operation, on account of the fact that while in Baltimore attending the recent meeting of the Southern Dental Society, an essay was read, bearing

* The operation referred to above was performed a few days after the meeting. In using the rubber dam the clamp was first applied and pressed as far up the root as possible so as to get above the point where the fracture terminated. To do this it was necessary to cut away a portion of the gum. Having adjusted the clamp the dam was then slipped over it, the gold screws inserted in the roots, and the operation performed with No. 4 soft foil to the entire satisfaction of the patient and several professional friends who have examined it.—J. H. MOQ.

on this subject, in which contour fillings were denounced as impracticable and unjustifiable under all circumstances. The views advanced were received with evident approval by a number of the members, and not a dissenting voice was heard until the president expressed the hope that so important a subject would not pass without discussion. Advocating on that occasion the introduction of contour fillings, I did it on *eclectic* principles, performing such operations when they are demanded; and, on the other hand, making V-shaped spaces when that course is indicated as the best adapted to meet the necessities of the case. In general surgery the advisability of the performance of capital operations is not decided by individual cases, but by a fair average of success attending such operations; so it should be in operations on the teeth: the average should decide the question.

For one I am not prepared to throw contour fillings aside, or adopt a practice pursued by some of cutting away considerable portions of the masticating surface and thereby destroying the utility of the teeth. Personally I should prefer contour fillings, and would rather lose my own teeth at once than have them cut and slashed in a manner I have seen done. Although patients may submit to this now, the time will come when there will be a reaction, and the prejudice against the *abuse* of the corundum disk will be as great as ever existed against the file. Either of these instruments, when *used with judgment and discretion*, is invaluable; but one might with as much propriety remove a healthy crystalline lens for fear that some day it will become the seat of cataract, as by cutting away unaffected portions of the masticatory surfaces of a tooth to anticipate decay. This is not *conservative* but *meddlesome* surgery, and an eminent writer has justly said, "Meddlesome surgery is bad practice."

Dr. Dixon in his remarks practically indorsed the previous speaker, and described a case of building-up of a central incisor that was all gone but the labial wall. He used two of Mack's screws, one on either side of the axis of the tooth, cutting a broad, shallow retaining pit between, the sides of which he heavily undercut; the tooth contained a living pulp which had receded above the line of the gum; it was still intact, having protected itself by a deposit of secondary dentine.

Dr. Eisenbrey's sentiments on the subject of contour fillings are the same as they were four years ago, at which time he expressed himself as opposed to such practice; only in very few cases is such treatment practical, and those cases are where the teeth are standing alone (or at least free when the filling is to be put in), and when free spaces exist without any danger of closing up after being filled; and then in all cases the teeth should possess good solid borders. Believes that one-third of the contour fillings put in are failures; where teeth are close and crowded in their position they should be separated, and filled on

mechanical principles, self-cleansing (if you please to call it so). Modified self-cleansing contour fillings in proximal surface cavities is good practice. Always tries to avoid pockets for the retention of food near the necks of the teeth, such as contour fillings leave in the majority of cases. Has never yet seen good results from such fillings where teeth are close together; after a lapse of three or four years they fail very rapidly at the margin of the gums.

Dr. E. H. Neall has endeavored for about five years to practice the method of restoring decayed teeth to nearly their original shapes, and thus far has seen no cause to abandon it; he notices the fact of the utmost care being necessary in all cases to have solid foundations and good retaining points, and thinks it better to allow sufficient space for easy cleaning.

Dr. W. A. Breen favored contour fillings, and recalled in particular a left superior second molar filled in this way six years ago. Saw it a short time since, and found it in good condition.

Dr. Stellwagen did not approve of contour filling as it is usually understood: namely, restoring teeth to their original shape, but preferred the modification as practiced by Dr. Marshall H. Webb, of Lancaster, of building them out to a shape that will be self-cleansing. He described a case operated upon where a lower molar, the crown of which had completely disappeared, leaving a solid smooth base even with margin of the gum, had screws inserted at each of the four corners, and a golden crown built upon it shaped somewhat like a truncated pyramid, high enough to antagonize with the upper teeth, so as to subserve the purposes of mastication. This performed its work admirably. He considers it a better operation than if he had built up a crown anatomically perfect, for it now does not permit the lodgment of food between it and the adjoining teeth.

Dr. McQuillen moved that a committee of five be appointed to take into consideration the practicability of giving a microscopical exhibition, to be devoted mainly to the teeth in man and animals; the said exhibition to take place in the rooms of the Philadelphia Dental College some time in October. The motion having been adopted, the following were chosen as the committee:

Drs. J. H. McQuillen, Alonzo Boice, E. H. Neall, J. L. Eisenbrey, and E. L. Hewitt.

Dr. Stellwagen by permission read a report of a case of neuralgia from Dr. Serjio M. Rasellon (see DENTAL COSMOS for February, 1873, page 112). He then described the building-up of a temporary artificial cutting edge upon a broken lateral incisor with oxychloride of zinc (Fletcher's solution), which had remained several months. The color was perhaps better than that of gold, but its opacity was so marked as to be very objectionable.

The same member then called attention to another patent on the retaining screws, whereby the heads are split and bent over to clinch them.

A meeting of the society was held Wednesday evening, October 1st, 1873.

Dr. J. Lehman Eisenbrey, Vice-President, in the chair.

Prof. Thomas Summers, of Nashville, Tennessee, was elected an honorary member, and Dr. Samuel Welchens, of Lancaster, Pa., an active member, of the society.

On motion of Dr. McQuillen, it was resolved that Dr. Jos. G. Richardson be invited to address the society at the next meeting.

After an exhibition of some specimens of salivary deposit under the microscope, and a discussion on the subject, the meeting adjourned.

A meeting was held Wednesday evening, November 5th, 1873.

Dr. Jos. G. Richardson delivered a lecture on the "Identity of the Salivary Globules with the White Blood-Corpuscles."

At the conclusion, Dr. F. M. Dixon offered the following, which was adopted :

Resolved, That the thanks of the members be tendered to Dr. Jos. G. Richardson for his exceedingly interesting and instructive lecture, with the clear, beautiful, and comprehensive illustrations on the black-board and otherwise; also, that a copy be requested for publication.

Dr. McQuillen made some remarks on dilaceration, and showed a central incisor with the crown bent at a right angle with the root, which he had recently received from Dr. J. M. Comegys, of St. Albans, Vt. He also presented a large plaster model of an incisor in the same condition (made by Prof. J. Foster Flagg, and used for class demonstration in the college), and placed under the microscope a longitudinal section of a dilacerated incisor, prepared by Dr. Geo. S. Allan, of New York; also under two other microscopes a preparation of a human embryo, aged twenty-nine days, and a specimen of vascular dentine, forwarded by Dr. R. R. Andrews, of Cambridge, Mass.

Dr. McQuillen said the success of the recent exhibition given under the auspices of the Odontographic Society was due in a great measure to a number of medical friends who kindly aided with the loan of their microscopes. He therefore moved that a vote of thanks be extended to these gentlemen for their assistance, and that it be conveyed to them individually by the Corresponding Secretary.

Passed.

On motion, the Microscopical Committee was continued.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

A STATED monthly meeting of this association was held in the Pennsylvania College of Dental Surgery, on Tuesday evening, November 11th, 1873.

Dr. Spencer Roberts, President, in the chair.

After the election of several gentlemen to membership, Dr. James Tyson, Professor of Physiology and Microscopic Anatomy in the Pennsylvania College of Dental Surgery, delivered a lecture upon the Histology of Cementum, of which the following is a synopsis :

Dr. Tyson said he had been asked by the officers of the association to give some account of the minute structure of *cementum*, by way of introduction to a discussion in which it was hoped much valuable information would be elicited with regard to its pathology. His remarks would be brief, perhaps somewhat desultory, and could not be dignified with the name of "lecture." The subject is a limited one, and may present a wider field in its pathology than in its histology. The general resemblance of this tissue to bone suggests a comparison of these structures, which results in a conclusion that they are in the main identical, presenting the common features of *lacunæ*, *canaliculi*, and, under certain circumstances, *Haversian canals*. At the same time there are some points of difference which are sufficiently striking to make it worth while to point them out.

First. There are not generally Haversian canals, for the same reason that these vascular spaces are wanting in certain thin bones. The proximity of the most remote parts to the periosteal covering is such that no special provision is required for their nourishment over and above what lies in the *lacunæ* and *canaliculi*, filled with succulent material. If, however, it happen that the cementum be hypertrophied, and its thickness, in consequence, is considerable, Haversian *canals* are not wanting, and an approximation to Haversian *systems* is produced, though there is never that regular, symmetrical, concentric arrangement of the *lacunæ* about the central vascular canal which is present in bone. Sections of *exostoses*, so called, of cementum, were shown under the microscope, exhibiting both longitudinal and transverse sections of Haversian canals. The sections were made and mounted by Professor Wildman.

Second. The *lacunæ* of cementum are generally larger, more irregular, and they are less numerous, than the *lacunæ* in bone, while thin sections of cementum can often be made which may even be as thick as the $\frac{1}{100}$ th of an inch, in which there are actually no *lacunæ*.

Third. The *canaliculi* are often very much longer than those of bone, and approach, in some instances, the characters of dentinal tubules, and thus often extend themselves into the dentine. If they be admitted to

be channels for nutrient matter, as seems necessarily to be one of their functions, this increased length would appear to be simple provision for the nourishment of parts remote from blood-vessels.

Fourth. The intercellular substance, or "*matrix*," of cementum, is harder and more transparent than that of bone, approaching rather that of dentine.

It should not be lost sight of that in the living condition the lacunæ of cementum, as those of bone, are not empty spaces, but are filled with bioplasm or germinal matter, constituting the "bone cell" or "elementary part" of bone and cementum. That bioplasmic prolongations of these masses also extend for a certain distance, at least into the canaliculi, seems likely.

With regard to the mode of formation of cementum, it has been remarked that it was a late formation compared with that of the other elements of tooth structure, enamel and dentine,—that it was formed after much of the dentine and enamel were produced.

Some difference of opinion exists as to the exact tissue which undergoes conversion into cementum, some alleging that it results from ossification of the tooth-sac, while others, among whom are Kölliker and Beale, believe it to originate in a soft stellate tissue, made up of branching and communicating cells, which is found upon the surface of the fangs of teeth and within the tooth-sac. This tissue undergoes calcification, spherules of lime-salts being deposited, which gradually fuse and form a transparent intercellular substance. In this process not all of the cells of the stellate tissue become lacunæ of the cementum, but some are obliterated by the deposit, and there are therefore fewer lacunæ in the resulting cementum than in the previous stellate tissue, while the canaliculi are much more numerous than the prolongations of the stellate cells, many of the lacunæ having thirty or forty prolongations, while the stellate cells rarely have more than from ten to twelve. Cementum is more slowly formed than bone; it is a more permanent, but probably a less perfect tissue than bone.

This view is rendered highly probable by the fact that the stellate tissue of branching cells is found upon the fangs of most adult teeth, where it becomes the medium of the exostoses so familiar to the dental profession.

Prof. Truman remarked: There is very little difference between cementum and true bone. The lacunæ of cementum are larger, and if there be an increased development of this tissue the lacunæ assume more of a concentric position around a central canal. Owen, in his "*Odontography*," noticed these canals in cementum, and they were subsequently described by Tomes, in his "*Dental Physiology and Surgery*."

The extra development of cementum, or, as it is termed, exostosis,

is a source of fruitful trouble. This increase is undoubtedly caused, in the majority of cases, by an external irritation, but this will not serve as a universal explanation. The external may be illustrated by the pressure of a plate made over roots, the unequal bearing of a clasp attached to a tooth, and the constant use of one or two teeth in mastication. But slight irritation is required to arouse anew the developing energy, and this will continue until the source is removed.

We find the same law of secondary depositions operating in dentine: This is illustrated by depositions of osteo-dentine in teeth wearing slowly down by attrition; the consolidation of the tubules, first described by Tomes, retarding, if not arresting, the progress of caries.

Exostosis is very difficult, if not impossible, to diagnose. We can look to it as the source of many nervous derangements, and it is therefore of very considerable pathological importance. Tomes relates a case of a boy who was subject to epileptic fits, having from two to three daily. The spasms ceased upon the extraction of an exostosed tooth. Fox, also, writes of a lady who, to relieve severe suffering, had finally all the teeth in both upper and lower jaws removed, and all exhibited an increased deposit of cemental tissue. Permanent relief was only afforded after the entire eradication of the teeth.

The opinions of observers vary materially in regard to its development. Kölliker asserts it is produced from a rich net-work of vessels, which furnish a soft blastema, in which nucleated cells are formed and immediately ossified.

Robin and Magitot contend that a difference exists between the development of cement in some of the lower animals and that of human teeth. They assert that a special organ exists that they term the "organ of the cement." This lies between the follicular wall and enamel organ, and is not of equal thickness throughout. It is owing to this fact that the cement is found of unequal thickness. The cement of the root originates from materials furnished by the periosteum.

Waldeyer regards the cement as a development from the periosteum, and repudiates the Robin and Magitot theory.

Wedl says that on the outer layer of cement will be found a minute mass of nodules, in intimate connection with periosteum.

Professor Barker said: In an extended experience I have seen some rare and interesting cases of exostosis, some specimens of which are upon the table. Although exostosis is difficult to diagnose, it is not impossible. I have rarely found it in patients under thirty years of age, and generally in the dense yellow teeth. The color is at least some indication of its presence. Some diseases predispose to it. In one case presented, the patient was suffering with secondary syphilis, and had lost nearly all of his upper teeth on account of exostosis. In another I extracted a central incisor very much enlarged, the exostosis

having been caused by biting thread. Gout predisposes to it, and in one case when the teeth were analyzed uric acid was found upon them, a spicula being deposited near the apical foramen.

Professor Truman. An interesting fact in reference to cementum, which should not be overlooked, is the important position it occupies in the crowns of many of the lower animals. In the ruminants and herbivora we find it developed and arranged so as to best subserve the purposes of mastication. Layers of enamel, dentine, and cement, each take part in this process; the outer being enamel, the next dentine, and the inner cement. The last, the least dense, wears away with the greatest rapidity, leaving a hollow for the retention of the food whilst it is comminuted by the harder tissues. The same wise provision we find in other orders, as in the chisel teeth of the rodents; but in this case cement does not form a part, the teeth being kept always sharp by the unequal wearing of enamel and dentine of different densities. Teeth are modified in their construction to adapt them to the requirements of the animal. When great resisting force is necessary an enamel is provided of even greater density than our own, as in the round teeth of the sargus, to enable them to crush the crustacea without material loss.

Professor Wildman. It has been denied that the structure of cementum is similar to that of bone on account of the absence of Haversian canals, but in my investigations I have found them frequently, and generally when there is hypertrophy of considerable extent. They may be seen in some of the specimens under the microscopes upon the table. In one of these the enlargement is in well-defined strata, having a large number of lacunæ; another shows a longitudinal view of a Haversian canal; another is a transverse section of two well-defined Haversian canals, around one of which there is the concentric arrangement of the lacunæ, but not so perfect in form as it is seen in bone. Under the other microscopes different views of these canals may be seen, as well as the other tissues of the teeth.

Dr. Wert. Reference has been made to the serious effects of exostosis. Some time ago a lady came to my office to have a right inferior bicuspid tooth extracted, as she had suffered very much with it. She was very deaf in her right ear. I found it very difficult to extract the tooth, the root of which was enlarged very much, being indeed as large as the crown. Almost immediately after its extraction she turned to the friend who accompanied her, and remarked that her hearing was restored.

Dr. David Roberts. When I was a student with that "Gamaliel" in dentistry, Dr. Elisha Townsend, a gentleman from Kentucky, who had been treated for deafness unsuccessfully by several eminent physicians of that State for eighteen months, presented himself to the

doctor, with letters of introduction from some of them, asking for his diagnosis of the case. Dr. Townsend procured a piece of flat polished steel, one end of which he placed on each of the lower teeth of the gentleman successively, and holding the other end between his own teeth, he struck each tooth separately, and when the right dens sapientiæ was reached, his exceedingly sensitive ear detected a difference in the sound, which decided him on its extraction, and he found the roots very much "exostosed." The gentleman's hearing was soon after entirely restored, without any further treatment. He diagnosed the cause of the deafness only by its peculiar sound.

Professor Tyson. Both the cases related are examples of the well-known phenomena of reflex paralysis from peripheral nervous irritation. Similar effects upon the nervous system are noticed during the teething of infants, and although less frequently affecting hearing, or any single sense, than the entire consciousness or phenomena of motion, they are nevertheless of the same general character.

After the discussion, the gentlemen present, among whom were the students of the college, had an opportunity of examining many fine specimens of cementum and other tissues, under microscopes of different powers.

E. R. PETTIT, *Secretary.*

MICROSCOPICAL EXHIBITION OF THE ODONTOGRAPHIC SOCIETY

On Wednesday evening, at seven and a half o'clock, October 15th, 1873, the microscopical exhibition previously announced in the DENTAL COSMOS was given in the rooms of the Philadelphia Dental College, and visited by about five hundred ladies and gentlemen, who manifested the most marked interest in the display of instruments and objects.

The microscopes, forty in number, were placed upon the operating tables in the north and south operating rooms, extending the entire length of the two rooms, one hundred feet. The instruments were arranged so as to be a sufficient distance apart to afford a fair view of the objects without inconvenience to the visitors. In addition to the microscopes belonging to the members of the society, a number of valuable instruments were kindly loaned for the occasion by the Biological and Microscopical Section of the Academy of Natural Sciences, Professors Joseph Leidy, J. Aitken Meigs, Howell, Allen, Hunt, Wood, Barker, Drs. Pancoast, Fricke, Levis, Morris, Pepper, Packard, Duh-ring, Bertollette, Hunter, Deal, S. S. White, Messrs. Queen and Zentmeyer. The microscopes included every variety of form, from the one thousand dollar grand microscope of Ross and binocular of Beck, to the inexpensive student's microscope; embracing, in addition to the makers

just named, Hartnack's, Zentmeyer's, Wales', Powell & Lelland's, Nacet's, Oberhauser & Spencer's instruments.

The objects exhibited were mainly confined to the teeth of man and animals. The sections of the teeth of man, the cat, horse, cow, sheep, elephant, hog, etc., afforded an excellent opportunity of observing and contrasting the difference in the arrangement of the enamel, dentine, and cementum in those animals, while the gizzards of the cricket and the cockroach showed the provision made by nature for the comminution of their food. Among the more notable specimens shown, in addition to those already named, may be mentioned: 1st, a longitudinal section of a dilacerated incisor, and section of a human incisor with the cementum covering a portion of the enamel, prepared by Dr. George S. Allan, of New York; 2d, longitudinal section of a human molar with vascular canals in the dentine, and a human embryo of twenty-nine days, prepared by Dr. R. R. Andrews, of Cambridge, Massachusetts; 3d, section of an adult human incisor and the lower jaw (tooth *in situ*) with the vessels of the dental pulp and Haversian canals injected with carmine; hypertrophied root of human molar; enamel columns of human tooth; transverse section of buck's horn and six other sections of teeth prepared by Dr. J. S. Latimer, of New York; 4th, section of molar tooth and jaw of cat, with vessels of dental pulp; periosteum and Haversian canals injected with carmine, prepared by Bicknel, of Salem, and presented by Prof. O. W. Holmes; 5th, preparation of vegetable structures made by Prof. J. Gibbons Hunt; 6th, Müller's Diatomaceæ test plate from Dr. Albert Fricke, etc.

Dr. Joseph G. Richardson gave a very satisfactory demonstration of the circulation of the blood in the capillaries of the web of the frog's foot, in the museum of the college.

At nine o'clock, in the north lecture-room, Prof. S. B. Howell, aided by Prof. Hunt, exhibited a number of interesting objects by means of the gas microscope, and demonstrated to the crowded audience assembled the importance of this instrument as a valuable and indispensable aid to the teacher of histology and physiology.

The arrangement of the microscopes in the two operating rooms and in the museum distributed the company and gave ample room for all; but the capacity of the lecture-room was only sufficient to accommodate about half the visitors, and numbers were compelled to leave without seeing the exhibition of the gas microscope.

The success attending this effort on the part of the society has decided the members to give another microscopical exhibition at no distant day.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE sixth annual meeting of the American Academy of Dental Science was held on Monday, September 29th, 1873, in Wesleyan Hall, Bromfield Street, Boston.

Dr. Daniel Harwood presided.

The forenoon was devoted to a business meeting, at which the various annual reports were read and new members elected.

Dr. Harwood, having served the academy faithfully and acceptably as their president during the past five years, declined a re-election to that position, and the following gentlemen were elected officers for the ensuing year :

President.—Joshua Tucker, M.D.

Vice-President.—Luther D. Shepard, D.D.S.

Corresponding Secretary.—Edward N. Harris, D.D.S.

Recording Secretary.—W. Lewis Tucker, D.M.D.

Treasurer.—George T. Moffatt, M.D., D.M.D.

Librarian.—John Clough, M.D.

Board of Censors.—Elisha G. Tucker, M.D., Jacob L. Williams, M.D., Willard W. Codman, M.D.

At two o'clock in the afternoon the academy listened to the annual address, prepared by Prof. P. H. Austen, of Baltimore, who having been prevented from attending the meeting by sickness, his address was read by Dr. L. D. Shepard, of Boston. The subject was, "Is Dentistry a Liberal Profession?" and it was treated in the well-known able and scientific manner of the author.

The thanks of the academy were presented to Prof. Austen, and a copy of the address was requested for publication.

Interesting papers were read by Dr. Norman W. Kingsley, of New York, upon "What Decided you to Become a Dentist?" Dr. Asa Hill, of Norwalk, Conn., upon "The Progress Made in the Dental Art" during the thirty-five years that he had been in practice; Dr. John T. Codman, of Boston, upon "The Best Way to Spend a Vacation."

At five o'clock the members and other invited guests sat down to their sixth anniversary dinner at the Parker House.

E. N. HARRIS, D.D.S., *Corresponding Secretary.*

CENTRAL ILLINOIS DENTAL SOCIETY.

A MEETING of the dentists of Central Illinois will be held at Springfield, Illinois, on Tuesday, January 20th, 1874, at 10 A.M., for the purpose of organizing the "Central Illinois Dental Society."

Invitation is extended to all dentists, especially those of Central Illinois, to attend this meeting and assist in its organization.

JOHN M. HURTT.

KANSAS STATE DENTAL ASSOCIATION.

THE second semi-annual meeting of the Kansas State Dental Association was held at Ottawa, October 14th. President Griswold in the chair.

Dr. George B. Sanford, of Osage Mission, and Dr. W. L. Doyle, of Wichita, were elected to active membership. The following papers were read :

Dr. Wasson, of Ottawa, on "Anæsthesia;" Dr. S. M. Furman, of Leavenworth, on "Aluminium as a Base;" Dr. O. O. McNary, of Leavenworth, on "Taking Impressions of the Mouth;" Dr. A. H. Thompson, of Topeka, on "Cheap Mechanical Practice in our State;" Dr. Holmes, of Lawrence, upon the subject of "How can we best Educate the People as to the Value of the Natural Teeth;" Dr. Thompson, of Topeka, on "Dental Etiquette "

The report of the Committee on Defense against the Rubber Company was taken up, and the committee were instructed to employ attorneys, and to make an assessment of \$10 upon each member to defray expenses.

Dr. J. B. Wheeler, of Lawrence, was elected treasurer.

The association as a committee of the whole made a revision of the constitution and by-laws.

The report of the Executive Committee on the subject of legislation for the control of the practice of dentistry in the State was taken up, and on motion a committee was appointed, consisting of Drs. Holmes, Patterson and Callahan, with instructions to draft a law and submit it at the next regular meeting of the association.

On motion, the same committee were instructed to prepare and file papers of incorporation with the Secretary of State.

During the session of three days many subjects of interest were discussed; clinics interesting and profitable were held, and the meeting was pronounced a success.

Adjourned to meet at the city of Topeka, on the first Tuesday in May, 1874.

A. H. THOMPSON, *Recording Secretary.*

ERRATUM.

On page 609 of the November number of the DENTAL COSMOS I am reported as having said at the Saratoga Dental Convention that "Nitrous oxide gas improved by age."

I never said so; but I did say that "NITRATE AMMONIA, if properly kept, improved by age," and that gas, though less strong than when first made, could be given with safety, and insensibility to pain induced just as efficiently if given in sufficient quantity.

D. S. GOLDEY, *Oswego, N. Y.*

EDITORIAL.

THE SCIENCE AND ART OF DENTISTRY.

THE tendency of mankind to extremes is illustrated in the opposite positions assumed in reference to dentistry,—the apparent inability of many to comprehend more than one aspect of the subject.

Dentistry, according to one class or another, is either a science or an art, its successful practice depending chiefly on medical knowledge or almost entirely on mechanical skill. That it is both a science and an art is difficult, it would seem, of comprehension.

The fatal mistake of many in the profession lies in the adoption of one or other of these extreme views.

Even if the practice of dentistry—as some claim of all medical practice—be in its last analysis simply empirical, it would appear, nevertheless, that the term “science” is as applicable to it as to that of general medicine or of any other specialty.

If pathology means perverted physiology, and if dental lesions are expressions of such perversions, the consideration of their cause and treatment constitutes a philosophy or science, and the application of this philosophy either in preventive, palliative, or curative measures, whether local or constitutional, expresses the medical aspect of the practice. If such practice does not require a comprehension of physiological functions and pathological aberrations, then dentistry has no claim to be considered a science; but if such knowledge is essential, there can be no question as to the validity of its claim. If recognition of abnormal life actions, derangement of function, and of the rationale of cause and cure, constitute the science of medicine, or of any specialty of medicine, a like recognition is as essential in dental as in any other lesions; and we venture the assertion that no other specialty has a more methodically connected classification of facts, principles and laws on which to base its claim and predicate its practice, and no other can show so much justification for claiming specifness in treatment,—the accordance between anticipated and actual results.

The science, however, which teaches to know does not alone qualify for practice; the art which teaches to do is indispensable. Science is but the comprehension of the facts and reasons; art is the skill acquired by study, observation, and practice. Science is founded on principles; art is based on precepts. To know what to do, and why, is the science; to know how to do is the art.

The assumption, therefore, that dentistry is purely a science or simply an art is a half-truth,—the greatest possible falsification. Herein lies the mistake, as we have said, of many in the profession and of many seeking to qualify themselves for practice,—an undue es-

timate either of the science or the art to the undervaluing of the other; and herein lies likewise the problem of the best education for the highest practice. No man is worthy the title of Doctor of Dental Surgery whose claim is founded chiefly on manipulative skill, but without such skill he is equally unfitted for his calling.

We cannot discuss the relative value of one against the other where both are indispensable, but we do not hesitate to affirm that the science is easier of attainment than the art. The facts of anatomy, physiology, pathology, and therapeutics are acquired by most students more readily than is the ability to execute with the hands the dictates of the will. The one can be learned from lectures; the other only by thoughtful, careful, persevering labor. It is the union in one man of the science and the art which makes him more than artisan, more than doctor.

For a dentist to be compelled to admit that the treatment of caries the maxillary is beyond his sphere is no worse than to confess or demonstrate his inability to perform in the best manner the mechanical operations necessitated by pathological conditions. The doctor is not necessarily a mechanic; the mechanic is not necessarily a doctor; but the dentist should be both.

That there are very many in the profession who have not *graduated* in medicine does not vitiate the argument. The degree does not make the doctor. Nor would the fact that any number—say the vast majority—of dentists were totally ignorant of medicine. So much the worse, not only for them, but for their patients.

Significant of the thought of the profession of these facts is the course pursued by those who are educating their sons to be their successors. Having obtained their own professional education by private pupilage, they realize too well the inefficiency of that plan to recommend it, and, almost without exception, such sons are matriculated at a dental college. Again, if the father be a graduate in dentistry, the chances are that the son is advised to graduate in medicine as well as in dentistry; and thus the inexorable logic of events is demonstrating what is to be the future status of dentistry.

Assuredly, no one can long practice dentistry, no matter how well qualified for the operative department, without feeling keenly the disadvantage under which he labors if without a knowledge of medicine. On the other hand, as surely must he realize his deficiencies who has neglected or failed to acquire the handicraft of his calling.

The elevation of the profession, therefore, lies not alone in the perfection of its science, not alone in the perfection of its art, but in the harmonious advancement of both. If mere doctors are required for the practice of dentistry, the medical colleges have the advantage over the dental. If mere mechanics are sufficient, dental *colleges* are misnamed and their titles worthless. The highest style of a dentist is one

who is mechanic, artist, surgeon, and physician; and the wider his culture in all these directions the more successful will he be and the more worthy of success; nor is there danger that he will bring to the practice talent or skill for the exercise of which he will not find opportunity.

OBITUARY.

AGASSIZ.

PROF. LOUIS AGASSIZ died at Cambridge, Mass., Dec. 14th. The announcement of the death of no other private citizen in America could touch as with a sense of personal bereavement so many hearts. And not only in the land of his adoption, but throughout the civilized world, the sorrow for his departure will be spontaneous and profound. His name has stood for many years as the personification of modern science, and his self-abandoning devotion to the elucidation of scientific truth has made it not only a household word, but a household treasure in both hemispheres.

As student and teacher, his distinguishing characteristic is exemplified in his reply to a publishing firm, who wrote, asking him to write a work on natural history for use in schools: "It is not school books that we want—it is students. The book of nature is always open. All that I can write and say shall be to make them study that book, and not pin their faith to any other."

With admiration of his intellectual attainments is mingled a reverence for his character, which makes the tidings of his death felt as a national calamity.

Prof. Agassiz was born in Motiers, Switzerland, May 28th, 1807.

HENRY W. LADD, D.D.S.

DIED at Newport, Maine, on Wednesday, September 3d, 1873, Henry W. Ladd, D.D.S., of congestion of the lungs, after ten days' illness. Aged thirty-two years.

He studied with his father, and graduated at the Philadelphia Dental College in the class of 1868 and '69, and immediately succeeded his father in practice, who retired from the profession. He was a fine operator and always a close student, and truly adorned his profession. He was a member of the Maine Dental Society. He was the only child of his parents, who feel deeply stricken by this affliction. The community in which he lived mourn the loss of a highly respected citizen and a public benefactor

E. J. ROBERTS.

O. M. PIERSON, D.D.S.

WITH regret I announce the death of C. M. Pierson, D.D.S., who died in Newark, N. J., August 13th, 1873, of heart-disease.

He commenced the study of dentistry with Dr. N. W. Kingsley, and entered the New York College of Dentistry in the fall of 1867, and graduated in March, 1869. He soon after commenced the practice of his profession at Roseville, N. J., where he soon enjoyed a good practice. He was a good operator, kind, gentle, and courteous in his manner. He loved dentistry, and was anxious to promote the honor and dignity of his profession. The community, and the New Jersey State Dental Society in particular, has lost one of its most useful members.

C. S. STOCKTON.

PUBLISHER'S NOTICE.

THE NEW VOLUME.

THIS number introduces the Sixteenth Volume of the DENTAL COSMOS. Succeeding numbers will be issued on the first of each month following.

Dr. J. W. White will continue in the editorship.

Although the circulation of the journal is larger than at any previous time since its publication, and the subscription list is constantly growing, yet, believing that at the price it is a good investment for any practicing dentist, we should be glad to see the list of subscribers largely increased.

Our desire is to add to its usefulness with each volume, and thus to make it more and more efficient in the promotion of the best interests of the profession.

We ask as a special favor that all who intend to subscribe for the current volume will do so *promptly*, that we may determine the number of copies to print.

With the December number we sent bills to those whose subscriptions had expired.

We shall adhere to the system of cash payment in advance.

SAMUEL S. WHITE.

PERISCOPE.

A FREAK OF NATURE.—Under the unphysiological name of "L'homme-chien" there is at present being exhibited in Paris a Russian peasant of most remarkable appearance, whose portrait, with that of his son, we have engraved from photographs.* The father, Andrian Jeftichjew, aged 55, was born near Kostroma, in Russia. His whole face, nose, forehead, cheeks, and ears are covered with long brown hair, which extends also down his back for some little distance. The skin beneath the hair is apparently healthy, and no nævoid discoloration is to be seen even where the hair has been cut in order to enable the man to see. The French description likens his appearance to that of a "King's-Charles" (*sic*), but the resemblance is really more to a Skye-terrier. The son,



Fedor, is only three years old, and the hair is so much lighter in color and less thick that the skin is much more perceptible. The resemblance between father and son is, however, unmistakable.

A remarkable feature in both father and son is their nearly edentulous condition. The father is said to have had no teeth up to the age of seventeen, and then to have had four teeth only in the lower, and one in the upper jaw. The boy has only four incisor teeth in the lower jaw, and his gums give no evidence of there being germs of other teeth within them. These remarkable individuals have been examined at Berlin by Professor Virchow, who has published some remarks upon them in the *Berliner Klinische Wochenschrift* (No. 29, 1873), a translation of which appeared in the *Edinburgh Medical Journal* for September.

* We are indebted to the courtesy of the London *Lancet* for copies of these portraits.—Editor of the DENTAL COSMOS.

In a small work on the Human Hair, published in 1869, Dr. Herman Beigel has collected a number of somewhat similar cases of hirsute growth, the most remarkable occurring in a family in Burmah, three generations of which have developed a growth of hair on the face much



resembling that of the Russians now being exhibited. These individuals in Burmah had also the peculiarity of being nearly edentulous, one of them, a male aged thirty, having only four incisors and the left canine in the lower jaw, and but four incisors in the upper jaw; and another, a female, having the same absence of all back teeth, though her female child of five years is said to have had a complete first set of teeth.

A well-known example of unusual hirsute growth was seen some years ago in London in a woman called Julia Pastrana, who possessed a fine beard and an irregular double set of teeth, and whose body was also covered with hair. A remarkable instance of hair covering the body, occurring in St. Bartholomew's Hospital, is also described and figured in *The Lancet* of August, 1867.

The statement that a race of hairy men existed in Japan has been supported by Mr. Martin Wood, who read a paper before the Ethnological Society of London, in 1865, on "The Hairy Men of Yesso," but denied in the "Memoirs of the Anthropological Society of London" by Mr. Barnard Davis, who shows that the hairiness of the bulk of the race in question is in no way exceptional. Virchow, also, in the lecture we have referred to, states positively that neither in respect of the arrangement of the hair nor in regard to the teeth have these Ainos of Japan any analogy with the Russian or Burmese hairy men.

Mr. Darwin, in his work on "Animals and Plants under Domestication," has not failed to notice the relation between the abnormal growth of the hair and the teeth, and is of opinion that these cases forcibly call to mind the fact that the two orders of mammals—the edentata and cetacea—which are the most abnormal in their dermal

covering, are likewise the most abnormal either by deficiency or redundancy of teeth.—*The Lancet*.

HAIRY MEN.—The anthropological interest attaching to *hominex hirsuti*, always very considerable, has much increased since the observations of Darwin. Two remarkable examples—Russians, father and son—have lately arrived in Berlin, and have been the subject of a lecture by Professor Virchow, of which we find an abstract in the *Edinburgh Medical Journal*. They are peculiarly remarkable in being edentulous. They are not hairy men in the ordinary acceptation of the term, but more resemble some of the monkey-tribe (the Diana monkey, Cuxio, etc.), while their edentulous condition carries them yet lower in the animal scale. The eldest is a man aged over fifty-five, Andrian by name, said to be the son of a Russian soldier from the district of Kostroma. He was born during the period of service of his reputed father, and has no resemblance to him, to his mother, or to a brother and sister whom he possesses. To escape the unkindness of his fellow-villagers, Andrian fled to the woods, where he lived in a cave, and was much given to drunkenness; even yet he is said to live chiefly on *sauerkraut* and *schnapps*, but his mental condition, which is truly none of the sharpest, does not seem to have suffered, and he is, on the whole, of a kindly disposition and affectionate to his son and those about him. Andrian was married, and had two children, who died young; one of these was a girl resembling her father; but of the other, a boy, nothing can be ascertained. Fedor, the boy, exhibited with him, is three years old, and comes from the same village; he is said to be Andrian's son, born in concubinage; and it is most probable that this is the case, as it would be singular were two such creatures to originate independently in one small village. The peculiarity of these individuals is, that they have an excessive growth of hair upon one particular part of the body, namely, the face and neck; on the body and lower extremities there is also a stronger growth of hair, and particularly on the back and arms of the child there are sundry patches of .15 to .24 inch in diameter, covered with soft yellowish white hair, .12 to .24 inch long. Andrian himself has on his body isolated patches strewn, but not thickly, with hair $1\frac{1}{2}$ to 2 inches long. But all this is trifling and subordinate compared with the hair-growth on the face, to which attention is mainly directed. Andrian has only the left eye-tooth in the upper jaw; Virchow has not stated how many teeth are in his lower jaw; but from the context it is improbable that he has more than his son, viz., four incisors. The son has no teeth in the upper jaw, hardly any alveolar process, and the upper lip is very narrow, so that the upper jaw appears depressed; the father presents the same appearance. It is somewhat singular that a similar family has long been known to exist at Avu, and was first described by Crawford in 1829, and since then by Beigel. Three generations of this family are now known to exist. The grandfather, Shwe-Maon, had a daughter, Maphoon, and she again a son; all of whom present precisely the same peculiarities as in the family of Andrian, not only as to the growth of hair, but also as to the teeth. The grandfather has in the upper jaw only four incisors, in the lower jaw four incisors and one eye-tooth, and these teeth did not appear till he was twenty years of age. Maphoon has only four incisors in each jaw; the eye-teeth and molars are wholly wanting; the first two incisors appeared during her second year. The peculiarity of the hairiness in

these individuals is of the same type as in Andrian and his son, in whom every part of the face and neck, usually only covered with lanugo, is covered with long hair, the very eyelids being so covered, the eyelashes being normal, while flowing locks come out of both nostrils, and also out of the meatus auditorius externus. At first sight the occurrence of two such families in two such distinct parts of the world seem to point them out as "missing links"—as the unreformed descendants of an earlier race of man. And our thoughts are carried back to the Ainos or hairy Kuriles, who are believed to be the remains of the aborigines of Japan, and who now inhabit the northern parts of the island of Jesso and the southern part of the island of Saghalien. At first these aborigines were stated to be as hairy as our wild men; but from more accurate information, obtained by the Berlin Anthropological Society through the German resident, Herr Von Brandt, accompanied by numerous photographs and Japanese pictures of these Ainos, and from an examination of a skull recently obtained through Privy Councillor Von Pelican, Virchow is able to state with positiveness that, neither in respect of the formation of hair nor in regard to the teeth, have the Ainos any analogy with the Russian or Burmese hairy men. The Ainos are certainly hairier on the chest and extremities than the nations around them, but there is nothing peculiar in the distribution of the hair, and the males have hair only on the typical parts peculiar to man. There is not a shadow of a race-connection between the Ainos and the Russian hairy men, and only the most prurient imagination could connect the latter with the Burmese family. No doubt careful breeding could raise a new race of men from this accidental variety, just as various new races of domestic animals, dogs for instance, have been propagated from accidental varieties. Virchow, however, believes that the peculiarities belonging to the Russian as well as to the Burmese families depend upon peculiarities of innervation depending upon accidental congenital abnormalities in the trigeminus, within whose domain all these peculiarities present themselves, only to be ascertained by careful dissection.

—*British Medical Journal.*

PALATE AND TEETH IN IDIOTS.—Dr. W. W. Ireland, in an interesting report on the *post-mortem* appearance observed in five cases of idiocy (*Journal of Mental Science*, October), makes the following remarks with regard to the palate and teeth of idiots:

The most common deformity in congenital idiocy is a peculiar conformation of the palate, which has been described as highly vaulted or keel-shaped, resembling the impression of the keel of a ship, or it might be compared to the inside of a saddle viewed from below, the pommel being turned backwards, for the arch is sharper behind than in front, and there is occasionally a narrower furrow running along the middle. The cleft palate, which I have seen in three cases of idiocy, seems to be an exaggeration of this deformity. In many born idiots the palate appears quite normal, but I have found this malformation in thirty-seven out of eighty-six cases of idiocy in this institution. Many of the other cases were, of course, not congenital. Often the arching is confined to the posterior half or three-fourths of the palate, and the development of the alveolar processes is not interfered with, but congenital idiots have very often teeth deformed in shape, irregularly placed, and prone to early decay. This is especially the case in the upper jaw; out of 37 cases found to have a saddle-shaped palate, 11 had

good teeth, and 21 had teeth much decayed or irregular. The remaining five had a few decayed teeth. Two of the 37 cases had fissure of the hard palate; 14 had what may be called the Grecian aspect of the face, the forehead and the nose running in an uninterrupted slope. One, if not two, of the cases where the saddle-shaped palate was found was of hydrocephalic origin; at least, hydrocephalus was present.

There seems some connection between idiocy of all types and the healthy nutrition of the teeth. I have noted cases in which the teeth have fallen out and decayed in youth where the idiocy was the result of hydrocephalus, meningitis, or traumatic injuries of the brain. As far as my reading goes, the only writer who notices a highly-vaulted palate occurring in cretins is Dr. Blackie, who mentions this characteristic in two out of six cases of cretins which he describes. In cretins the teeth are generally bad, and Morel has proposed to found a distinction between cretinism and sporadic idiocy in the slowness of the appearance of the second teeth in cretins, but idiots, too, are often slow in getting their second teeth. As they are very apt to decay, it is rare to see a complete set of twenty-eight. The wisdom teeth do not commonly appear at all. In many cases the teeth commence to decay two or three years after they have appeared. They first turn black at the margin of the gums, then rapidly become hollow, and break in pieces. Very often before idiots have grown up only two or three rotten stumps remain. This process often goes on with great rapidity, three or four teeth being lost in as many months. It is not generally accompanied with much pain, though the gums become swollen, and purulent matter is found round the carious stumps. I am not able to offer any adequate explanation why bad teeth should be so common with idiots. If I may trust my own observation, lunatics do not seem to have worse teeth than the classes from whom they are drawn. But to return to the point from which we started, I have examined some preparations of the bones of the fœtus as well as the skulls of monkeys, in the expectation of finding that a highly-vaulted palate was the result of arrested development. I found, however, that in the human embryo the portion of the palate formed by the upper maxilla and palatal bone was flatter than in the adult. The palate of most monkeys appears also to be flat. That of the gorilla has a trough-shaped form, similar to what I have seen in a few idiots; but this shape in the ape seems to be dependent upon the prognathism of the powerful upper jaw and the great strength of the alveolar processes, whereas, in the cases with which I have compared it, the jaw, though narrow and trough-shaped, is not generally prominent, the narrow appearance being owing to diminution of the normal breadth rather than to increase of length. In the first years of childhood, however, the arch of the palate is higher and less rounded than it is in the adult. In the fœtal, as in the infantine skull, the pillars of the nares seem proportionally shorter than they are at a later age. I am not possessed of exact information how often a vaulted palate may occur in individuals of ordinary intelligence.—*The Doctor*.

VERDICT IN THE CASE OF DEATH IN A DENTIST'S CHAIR.—The coroner's jury in the case of Mrs. Crie made up the following verdict:

"That the death of Mrs. Mary F. Crie occurred on Monday, the 10th day of November, 1873, between 11 o'clock A.M. and 1 o'clock P.M., in the office of Dr. Charles Eastham, a dentist, at No. 25 Tremont

Street, Boston, and that the death was caused by the inhalation of chloroform administered in a mixture of ether by the said Dr. Eastham.

"The jury use this opportunity to caution the public against the inhalation of so dangerous an agent as chloroform for the production of insensibility to pain. In the opinion of the jury, the inhalation of sulphuric ether is safe; while the inhalation of chloroform, either alone or mixed, is always attended with danger."

This case has attracted much attention, not only from the attempt made just after the accident to pass the death off as one from ether, but also, when it became evident that it was due to chloroform, from anxiety to see what would be the conclusions of a Boston jury. The verdict is all that could be desired, as it expresses emphatically the feeling of the profession, and we do not find fault that Dr. Eastham was spared the well-deserved censure which he must have expected. The misfortunes of the past should be remembered only as warnings for the future. The use of chloroform is least justifiable where ether is best known; there is less excuse for its use in America than in Europe, and least of all in this city. After this verdict, nothing but very exceptional circumstances will warrant its administration. It appears in the evidence that several dentists are in the habit of giving whichever anæsthetic they see fit, regardless of the request of the patient. We hope that this custom is not general, and would advise any who may persist in it not to be too sure that after another patient, who shall have asked for ether, has been killed by chloroform, the verdict may not contain, besides other disagreeable words, the adjective "criminal."—*Boston Medical and Surgical Journal*.

NEW TREATMENT FOR EXPOSED PULP.—Several months since, while conducting an experiment upon capping exposed dental pulps, I discovered what I consider a generous anodyne for sensitiveness and tooth-ache incident to soft white decay.

Believing that dentine was to some extent renascible, and knowing that the dental pulp possessed great recuperative powers, I was impressed with the idea that something might be found that, as a local application, would induce the growth of a bony covering over the point of exposure of the pulp in a comparatively short time.

It seemed reasonable to me that a substance possessing most of the properties of tooth-bone would be the proper and efficient agent for producing an osseous substitute for lost dentine.

Of the powdered phosphate of lime I had no hopes, because of its well-known difficult solubility; but my attention had been called to a preparation known as the Syrup of Lacto-Phosphate of Lime, in which the phosphate of lime had been pre-digested in its proper solvent, lactic acid, and was therefore easily appropriated by the blood and tissues when given through the stomach.

I procured some freshly-prepared lacto-phosphate to which no syrup had been added, also some of the pulverulent phosphate of lime, and awaited patiently for the appearance of the next case of exposed pulp.

The formation of new bone was nothing new, but the application of *lacto-phosphate of lime* in this case was new, and the growth or deposition of the new osseous matter in nine days was to me the most

surprising of all that transpired in connection with the experiment. I would say in conclusion that I have used this same process with several exposed pulps since this first case, and with results highly satisfactory.

A solution of lacto-phosphate of lime, to which add pulverulent phosphate of lime sufficient to form a thin paste. Apply to pulp exposure, using no pressure, dry off the surface with bibulous paper or spunk, coat with shellac or sandarach varnish, and seal up with bees-wax or os-artificiel to prevent ingress of saliva.—*J. E. Cravens, D.D.S., in Missouri Dental Journal.*

ACTION OF NITROUS OXIDE.—Joylet and Blanche (*Archives de Physiologie*, v., July, 1873, p. 364) have obtained the following results from their experiments on this subject: Chemically-pure nitrous oxide will not support the respiration either of animals or plants, as they cannot decompose the gas. When breathed in a pure state by animals, it causes asphyxia and death, with all the symptoms usually occasioned either by strangulation or by the respiration of an inert gas, such as nitrogen or hydrogen. Nitrous oxide causes death in nearly the same time as these other asphyxiating agents. Nitrous oxide has no special anæsthetic action. The anæsthesia which it may produce when inhaled in a pure condition is only due to want of oxygen in the blood. Insensibility appears when the oxygen in arterial blood is reduced to less than 2 or 3 per cent. Arterial blood is then very dark, and contains 30 to 40 per cent. of nitrous oxide. Animals can live and show no alterations of sensibility while breathing mixtures of nitrous oxide and oxygen, in the same proportion as nitrogen and oxygen in air. The arterial blood then contains about 30 to 35 per cent. of nitrous oxide. Birds placed under a bell-jar filled with this mixture behave exactly like those placed in a jar of the same size filled with air, and die after having exhausted the oxygen to a similar extent, and formed a similar amount of carbonic acid. As nitrous oxide is an irrespirable gas, and does not possess the anæsthetic properties which have been attributed to it, the authors conclude that its employment cannot but be dangerous, and ought, on this account, to be excluded from medical practice.—*British Medical Journal.*

HINTS AND QUERIES.

FACTS VERSUS THEORY.—"A knowledge of nature begins with observation. The foundation of all science is in the observation of facts. Our knowledge would, however, be limited without a constant effort to extend experience by experiment. The solution of every problem is based on some previous recognition of physical facts."

I HAVE vulcanized celluloid at 320° in Hayes' Vulcanizer without accident, but found the plate porous.—*C. G. S.*

RUBBER DAM CLAMPS—SPECIAL CASES.—The value of the coffer dam or the appreciation of its value as an appliance in operative dentistry is shown, as much as in any other way, by the efforts constantly being made to devise ways and means, and to improve those we have, for making it applicable to a greater variety of cases. Most important among these are clamps; but, notwithstanding

the perfection of form which they have attained under the direction of their inventors, and the admirable suggestions that have been published for making them when that is necessary, occasionally a case presents difficulties which seem to be insuperable, even with all these helps; and we are perhaps constrained to consent to the performance of an inferior operation without the dam. Of such a character are cases where a wall of a bicuspid or molar cavity has been broken beyond the neck of the tooth, so that the pressure of the gum and the shape of the root make the tendency of the clamp toward the cavity, instead of toward the end of the root; and, also, the opposite side of the tooth is likely to offer (even by dissection of the gum) no bearing for a clamp far enough beyond the neck to make it hold in the desired position. It has not been suggested, I believe, that the desired end may be attained by *clamping another tooth*, that is, by making a clamp for the case, to grasp either the tooth anterior or posterior to the one to be operated on, which shall have an arm extending over to the point of difficulty. It may be constructed in less than an hour after obtaining a model of the teeth. If there is space enough to pass a piece of clasp metal between the teeth, make a clasp to fit the tooth next the one to be filled; if there is not the space required for this, then, of the same material, make a clamp to pass over the grinding surface, which shall be able to grasp the tooth firmly and securely. Next, having filed a piece of gold plate to a crescent shape, the concave edge to fit against the root of the broken tooth as nearly as may be, bend laterally to suit the form of the gum to be compressed, with the model trimmed to allow this piece to be placed as nearly as possible in the position it should occupy in order to effect the desired object. It only remains to connect the clasp or clamp on the next tooth to this crescent-shaped piece of gold by a bar of such shape as not to preclude access to the cavity. When this is soldered to both the appliance is complete. When the rubber has been slipped over the teeth it should be held in the desired position at the point of difficulty, with an instrument in one hand while the *clamp* is slipped in place with the other. I have three times succeeded with such an appliance in filling as well as I could have done under ordinary circumstances, and in each case was entirely baffled in the use of the ordinary means of retaining the dam.—J. MORGAN HOWE.

STEAM IN DENTAL OPERATIONS.—I notice among the proceedings of one of the western dental societies, reported in the November number of *Cosmos*, that one of the members gave expression to the desire that some method might be introduced in the working of the "Morrison Engine" which would allow the operator to have more control of his body than it is possible for him to have at present. Please allow me to put upon record the fact that I am the first to have used steam-power in dentistry, and to heartily suggest its use by others.

I have been using it daily for several months, and now feel that I could not possibly dispense with it. Its advantages are many: among which may be mentioned the fact that the engine (Morrison) may be placed entirely out of the way on the other side of the chair. The action of the drills is much more perfect, being made steadier. The speed is more fully under control, and may be made very much greater or very much slower than is possible by foot-power. The treadle is abolished, and of course the tiresome action of the foot and leg with it. The operator has as perfect control over his body as if he were doing nothing at all in the way of work.

There are many incidental advantages which are only to be appreciated by actual practice. Every operation performed upon the teeth I now do by steam-power,—excavating, putting in the gold (done by an instrument of my own in-

vention), finishing, polishing, separating, etc., etc. My patients are simply delighted with the arrangement, and it is needless to say that I am, for it relieves me almost entirely of any manual labor. All that I have to do now is simply to stand by my chair and *guide* my drills, or my plugger, as the case may be, in doing which there is no *labor* whatever. In the event of any persons adopting this suggestion, let me advise them to have a boiler made which is *safe* even under the most *reckless carelessness*. My own was made especially for me, and is guaranteed to *safely* bear a pressure of six hundred pounds per square inch; whereas I never desire to use more than thirty pounds per square inch, while ten will run the engine very nicely. The more perfect results are attained between twenty and thirty pounds, which is the usual quantity of steam that I use. I use gas for heating purposes, and the whole arrangement occupies but about four feet in length by two feet in width, boiler included. The whole thing is entirely out of my way, being upon the left side of my chair. Should this article attract sufficient attention to warrant it, I will, in another communication, explain more fully the style of boiler, engine, and additional gearing necessary for the Morrison Engine, together with method of the general communication of the steam, and manner of its being instantly and perfectly under the control of the operator.—J. FREDERICK BABCOCK, D.D.S.

THE CELLULOID BASE AND APPARATUS.—About three months ago I obtained a specimen of the new steam apparatus for moulding the celluloid base for artificial teeth, and have tried it in a sufficient number of cases to become thoroughly acquainted with its working capabilities, and can pronounce it precisely the thing that is needed by dentists who have adopted the celluloid. In every instance I have obtained perfect results from it when the proper conditions were observed. These conditions are imperative, though simple and easily obtained; but perhaps the best way to make myself understood is to give a brief sketch of my own experience.

Before undertaking to work the celluloid base I had a theory, *a priori*, respecting the proper method of its successful manipulation. It was, first, that a sufficient amount of heat should be applied to the substance to cause free and easy plasticity before much pressure is applied; and secondly, that after the plate has been pressed to its shape it should not be too suddenly cooled, but left standing *under pressure* till the new arrangement of particles could have a chance to become a *molecular* as well as mechanical arrangement. I reasoned with myself, that if this *molecular* arrangement could be obtained in perfection, there would be no likelihood, if even a possibility, of the plates warping afterwards, provided that it were perfectly seasoned and of good material. The truth of this theory I have demonstrated to my own entire satisfaction, though my first attempt to carry it out resulted in a ridiculous failure. It occurred in this wise: I raised the heat to a pretty high degree before I commenced screwing down the flask, and then was so slow in this last operation that the little cup of alcohol under the steam-chamber was burnt out before I got the two parts of the flask much more than half together. I renewed the alcohol, relighted my fire, and proceeded with my work in the same tardy manner, till the screw would no longer turn. On opening the flask, when it had got cold, I found the plate flaky, porous, honey-combed, and utterly ruined. I felt pretty blue about it, but after dreaming over it a little the cause of the failure occurred to me,—I had mistaken the nature of the article I had to deal with, and had cooked it to death. The excessive heat I had applied to it *before putting it under pressure* had vaporized the particles of

camphor diffused in the substance and caused it to puff up, as the gas from yeast causes the puffing-up of bread. I now mention this experience as a warning to others.

I tried the experiment again, this time commencing the application of the pressure, very gently, as soon as the safety-valve indicated a temperature a little above the boiling-point, and so regulating the motion of the screw as to have it entirely down by the time the cupful of alcohol was burnt out. The success was perfect and beautiful so far as the compactness and integrity of the plate were concerned; but there was not quite enough of the celluloid to come up well around the pins of the teeth. I procured a larger and thicker plate, and tried the operation again. The success was perfect in every respect, and, in my delight, I involuntarily cried, "*Eureka!*" so loud that I might have been heard in the street.

Since then, out of some dozen or fifteen cases, I have had ne'er a failure, except one which resulted from not being able to procure a plate thick enough to fill the mould. That was the occasion of my visiting the celluloid manufactory a few days ago, when I was supplied with a plate which answered the purpose admirably. I was glad to be informed that the manufacturers were preparing to place immediately into the market a due proportion of *thick* plates; and with these, together, perhaps, with a little more experience, I predict that the celluloid base will be, in every contingency, perfectly triumphant over all its competitors.

I have had no trouble whatever either from shrinkage or warpage. Two test-pieces, which I made to fit my own mouth early in September last, have been lying in my laboratory ever since, exposed to the air and sunshine from an open window, and they fit now just as well as they did the moment they came out of the mould. But I can conceive of conditions in which the shape of a plate may alter. If a plate is not, in the first place, properly seasoned, or if it is subjected to too great a pressure before being rendered sufficiently plastic by heat, or if it is relieved from pressure while still hot, or before its new shape has become *naturalized* by a corresponding new arrangement of its molecules, it has a *right* to spring and shrink, and I should not blame it.

My rule of operation is this: As soon as the piece is heated enough to be plastic (a little above the boiling-point), commence applying the pressure. Turn the screw only a little at a time, and each time wait a few seconds for the *slowly*-flowing celluloid to recede from the pressure. Then follow up the pressure very gently, *immediately*, and so continue till the screw is entirely down, graduating the motion so as to reach this end about the time the alcohol is burnt out. Then take the steam-chamber out of the cup-like frame which holds it, blow off a little steam so as to reduce the temperature a few degrees and insure the plate against the danger of still burning on the impressed edges, and then let your apparatus stand until it gets cold before unscrewing it.

In one instance I suspected that a plate had not been well seasoned. After taking it out of the flask and trimming off the edges, I surrounded it with plaster, and kept it for about twelve hours in a vessel of water over a Sandford's register, at a heat some thirty or forty degrees below the boiling-point. It came out all right, and I had no further trouble with it.

If any dentist will follow these rules *strictly* in working the celluloid, and is afterwards troubled with shrinkage or warpage, I will allow him to throw the piece at my head the first time he sees me.—WILLIAM FISHBOUGH, *Brooklyn, N. Y.*, December 5th, 1878.

VULCANITE LITIGATION.

It will be remembered that it was stated in the November number of the DENTAL COSMOS that a stipulation had been signed between the counsel to complete and try the Massachusetts suit as a test case. We give below a copy of this stipulation.

Under this agreement, the Company having put in their *prima facie* case, the defendant proceeded to put in his proofs and to take testimony in New York and Philadelphia, closing December 17th. The complainants also closed on the 17th of December. The cause has been set for hearing on the 14th of January, before Hon. George F. Shepley, Circuit Judge for the First Circuit.

United States Circuit Court.

DISTRICT OF MASSACHUSETTS.

GOODYEAR DENTAL VUL-	}
CANITE COMPANY AND	
JOSIAH BACON,	
vs.	
DANIEL H. SMITH.	

DISTRICT OF NEW JERSEY.

SAME,	}
vs.	
CHARLES S. STOCKTON.	
SAME,	}
vs.	
FRANK A. CUMMINGS.	

DISTRICT OF DELAWARE.

SAME,	}
vs.	
ZENAS A. VANDEVENTER.	

EASTERN DISTRICT OF PENNSYLVANIA.

SAME,	}
vs.	
ROBERT E. DIFENDERFER.	

New Suit,
Bill filed, Sept. 1873.

<p>SAME, <i>vs.</i> WILLIAM H. GATES.</p>	}	<p>New Suit, Bill filed, Sept. 1873.</p>
<p>SAME, <i>vs.</i> WM. HARVEY ROOP.</p>	}	<p>New Suit, Bill filed, Sept. 1873.</p>
<p>SAME, <i>vs.</i> GEORGE A. SINCLAIR.</p>	}	<p>New Suit, Bill filed, Sept. 1873.</p>

It is stipulated and agreed that all proofs taken for final bearing in the above entitled suit of Goodyear Dental Vulcanite Company et al. *vs.* Daniel H. Smith shall be taken as the proofs for final hearing in each of the above entitled causes, a printed copy of the proofs in said suit taken on behalf of each party, including documentary exhibits, shall be filed with the clerk of the court in each of the above districts within ten days after the proofs are closed on behalf of such party, as the stipulated testimony in the above entitled cause pending in said district, and such testimony shall be read and used at the hearing of each of said causes the same and with the same effect as if the same had been regularly and duly taken in each of said causes separately. Within the same period of ten days, 10 copies of defendant's proofs shall be delivered to Lee & Alvord, of New York, for the use of the complainants, and within the same time, 10 copies of complainant's proofs shall be delivered to Henry Baldwin, Jr., Esq., of Philadelphia, for the use of the defendant. Said suit *vs.* Smith shall be placed on the calendar for the October Term, 1873, and shall be brought to final hearing before the Circuit Judge of the First Circuit at the earliest day that he will appoint not less than thirty days after the printed proofs on both sides are interchanged as above provided, and at any place within said Circuit that said Judge may designate; the party proposing to apply for such appointment to give seasonable previous notice to the opposite party of the time and place which are proposed in the application to be made for such appointment. None of the causes above entitled shall be brought to hearing on pleadings and proofs, or otherwise, until after the said Smith suit shall have been decided.

All proceedings in said causes shall be had under due notices, to be served only upon and by Lee & Alvord for complainants, and upon and by Henry Baldwin, Jr., for defendants. Said testimony may be taken before Aubrey H. Smith, Esq., of Philadelphia, Kenneth G. White, Esq., of New York, or John G. Stetson, Esq., of Boston, who are hereby agreed upon as Special Examiners for that purpose. It is

understood that the printed copies of the proofs already taken by the complainants may be filed and served within ten days after the signing of this stipulation dated September 30th, 1873.

(Signed)

LEE & ALVORD,

*Sol'rs for Compl'ts in suits vs. Smith,
Stockton, and Cummings.*

J. E. SHAW,

*Sol'r for Compl'ts in suits vs. Difenderfer,
Gates, Roop, and Sinclair.*

SAMUEL M. HARRINGTON,

Sol'r for Compl'ts in suit vs. Vandeventer.

During the taking of complainants' testimony they issued the annexed subpoena, making the undersigned a witness in the case.

The President of the United States of America, to

Samuel S. White,

Greeting:

L. S.

U. S. Supb. WE COMMAND YOU, That, all and singular business and excuses being laid aside, you and each of you be and appear in your proper persons, before John A. Shields, Esq., special examiner in suit hereinafter mentioned, and a Commissioner appointed by the Circuit Court of the United States of America, for the Southern District of New York, in the Second Circuit, at the office of Lee & Alvord, No. 20 Nassau Street, in the city of New York, in the said Southern District of New York, on the 21st day of November, one thousand eight hundred and seventy-three, at 4.20 o'clock in the afternoon of the same day, to testify all and singular what you and each of you may know in a certain cause now depending undetermined in the Circuit Court of the United States for the District of Massachusetts, wherein the Goodyear Dental Vulcanite Company and Josiah Bacon are complainants, and Daniel H. Smith is defendant, on the part of complainants.

And this you or either of you are not to omit, under the penalty upon each and every of you of two hundred and fifty dollars.

WITNESS Hon. Nathan Clifford, Associate Justice of the Supreme Court of the United States, at the City of New York, the twenty-first day of November, in the year of our Lord one thousand eight hundred and seventy-three.

(Signed) KENNETH G. WHITE,
Clerk.

As an element of the history of the attempts to embarrass those who regard the Cummings patent invalid, an action has been commenced against the publisher of this journal, by a writ served upon him Dec. 10th, 1873, of which the following is a copy.

It will thus be seen that we have not only been subpoenaed as a witness for the Company, but also have been sued as a trespasser on their alleged rights.

The President of the United States of America, To

The Marshal of the Southern District of New York, Greeting :

We command you, as we have before commanded you, that you take Samuel S. White, of Philadelphia, Pennsylvania, and a citizen of the State of Pennsylvania, defendant, if he shall be found in your district, and him safely keep so that you may have his body before the Judges of the Circuit Court of the United States of America for the Southern District of New York in the second circuit, to be held at the United States Court Buildings, No. 41 Chambers Street, in the city of New York, in the said Southern District, on the first Monday of January, 1874, to answer unto The Goodyear Dental Vulcanite Company, a corporation created by the laws of New York, and a citizen of the State of New York, plaintiff in a plea of trespass ; and also, to a certain bill of the said plaintiff against the said defendant for a plea of trespass on the case to the damage of said plaintiff in the sum of one hundred thousand dollars, according to the custom of the said court, before the said Judges, then and there to be exhibited, and that you have then there this writ.

WITNESS the Honorable Nathan Clifford, Associate Justice of the Supreme Court of the United States, at the city of New York, the third day of December, in the year one thousand eight hundred and seventy-three, and of the Independence of the United States the ninety-eighth.

LEE & ALVORD,

Attorneys.

KENNETH G. WHITE,

Clerk.

We do not know what trespasses we have committed upon any rights of the Company bringing this action, but will doubtless be informed by the specification of their charges when filed.

The further progress of these cases will be duly reported in the DENTAL COSMOS.

SAMUEL S. WHITE.

THE DENTAL COSMOS.

VOL. XVI. PHILADELPHIA, FEBRUARY, 1874.

No. 2.

ORIGINAL COMMUNICATIONS.

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

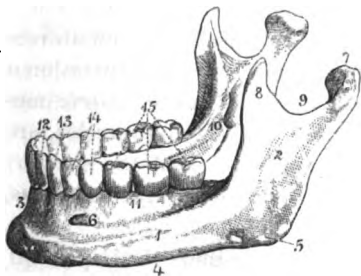
PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 14.)

THE REGION OF THE LOWER JAW.

THIS region is defined by the inferior maxilla, which it is necessary to describe before passing to those divisions of our subject based upon its structure.

FIG. 9.—INFERIOR MAXILLARY BONE.



1, body; 2, ramus; 3, symphysis; 4, base; 5, angle; 6, mental foramen; 7, condyle; 8, coronoid process; 9, semilunar notch; 10, inferior dental foramen, the entrance of the corresponding canal; 11, alveolar border; 12, incisor teeth; 13, canine tooth; 14, premolars; 15, large molars.

The inferior maxilla or lower jaw is the largest and most massive bone of the face. It forms the boundary of the under part of the anterior and lateral region of the face, where its lower border can be defined under the skin. It consists of a horizontal arch, with its curves diverted in front and its sides elevated at an angle behind. The bone is moved on the base of the skull at the temporal bone by powerful muscles.

The lower jaw is composed of two halves; after their union it is convenient to divide the bone into a body or horizontal portion, and two ascending portions or rami. The body of the bone is marked above

by the edge of the alveolar process, and below by a thickened, rounded border. In the median line at the point of union of the primitive halves is a linear ridge,—the symphysis. The widened and projecting basal extremity of this line is called the mental process. At the side of the symphysis, on a line with the lateral incisor tooth, is the incisor fossa, from which the *levator labii inferioris* arises. Below this point, and to its outer side, is a shallow depression for the *depressor anguli oris* muscle. The line of insertion of the *platysmus myoid* muscle lies below the latter, on the basal border. Opposite and below the insertion of the interspace between the second molar and first bicuspid, and about midway between the basal border and the teeth, is seen the anterior dental foramen, which affords exit to the inferior dental nerve and artery. The basal border of the body near the ramus is grooved for the reception of the facial artery. Extending obliquely upward and backward to the anterior root of the coronoid process is the external oblique line.

The inner side of the body is conspicuously divided by an oblique ridge, which extends from the base of the coronoid process downward and forward. This has received the name of the mylo-hyoid ridge, and serves for the origin of the *mylo-hyoid* muscle. Between this ridge and the molar teeth slips of the *buccinator* and *superior constrictor* muscles are attached.

At a point below the canine teeth, a smooth depression supports the anterior border of the sublingual salivary gland. Below the ridge, a small groove running nearly parallel therewith receives the mylo-hyoid nerve and artery. A well-marked oval depression near the basal border anteriorly is for the insertion of the *digastric* muscle. At the lower part of the symphysis are the genial tubercles, ordinarily composed of four processes,—two on either side of the median line. The superior process is for the origin of the *genio-hyoid glossus*, and the inferior for the *genio-hyoid* muscle.

The ascending portion, or ramus, is imperfectly defined from the body anteriorly. Posteriorly it presents a robust, rounded border, which is separated from the basal portion of the body by the angle. The outer surface of the ramus is in great part roughened for the attachment of the *masseter* muscle. It presents two conspicuous processes, the coronoid in front and the condyloid behind. Between them is a deep hollow, the sigmoid notch.

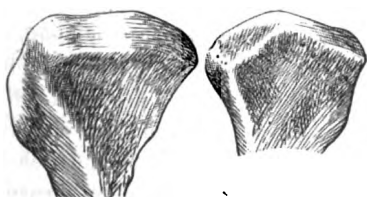
The inner aspect of the ramus is conspicuously marked by the dental foramen, for the entrance of the inferior dental nerve and artery. The anterior margin of this opening is produced into a thin plate of bone, pointing backward, which gives attachment to the deep fold of deep fascia known as the internal lateral ligament.

The coronoid process is flat and pointed. It is directed slightly backward. It is thin at its upper portion, but thicker below. Its

front edge is nearly straight, and presents at its base behind the thin molar tooth a groove, within which is held a slip of the *temporal* muscle, as well as the buccinator muscle. Its posterior edge is thin, and continuous with the curve of the sigmoid notch. The outer surface is devoted to the insertion of the temporal and masseter muscles, and the inner to the temporal alone.

The condyloid process, more massive than the coronoid, is a continuation of the posterior free margin of the ramus. It presents for examination a neck and the articular surface. The neck corresponds to that portion of the process directly below the articular. It is compressed from behind forward, and receives at its inner portion a shallow depression for the external *pterygoid* muscle. The outer margin of the neck is marked by a minute rounded process, the tubercle for attachment of the external lateral ligament. The articular surface is convex from before backwards, abruptly arched from within outwards. It is often angulated at a point answering to the axis of the ramus. The

FIG. 10.



articular surface is not directed transversely, but somewhat backward. The production of the lines of inclination of the two surfaces would intersect at the anterior margin of the foramen magnum.

Dental Canal.—We have noted for each side of the body two foramina, the dental or posterior, and the mental or anterior. The canal between these two points is termed the dental canal. It passes beneath the alveolar process, and sends veins and blood-vessels to the teeth. At its beginning it lies near the inner surface of the bone, but towards the first molar it holds a more central position, and ends abruptly externally at the mental foramen.

We propose studying the lower jaw from the following points of view: (a) As divided into a right and a left half; (b) as divided into the alveolar as one part and the remainder of the bone as another; (c) as divided into muscular impressions as one part and the remaining non-muscular part as the other; (d) as divided by the mylo-hyoid ridge into *facial* relations (*i.e.* all the parts above the ridge and the entire outer surface of the bone) and the *cervical* (*i.e.* all the parts below the ridge); (e) as compared with a long bone; (f) as determining the localization of tumors.

(a) *The lower jaw as divided into a right and a left half.*—The lower jaw, in common with other symmetrical parts of the skeleton, exhibits those curious manifestations of physiological and morbid action (which have been so admirably described by Paget), but in a much weaker degree than in the bones of the extremities. Seeking for a reason for this, it is found in the impairment of the physiological identities of the halves by their union at the symphysis. It is probable that in lower mammals, such as the ruminants and marsupials, in whom the halves never unite, that the law of symmetrical distribution of disease might be found better expressed.

The following instances may be cited to show that disease tends to occupy the *sides* of the jaw rather than the median line, and excesses of nutrition are apt to occur on either side of the symphysis to an equal degree. In confirmation of the latter statement, we may refer to those extraordinary developments of symmetrical hyperostosis recorded by Lebert* and Murchison;† and for the former, the clinical fact that growths of all kinds are vastly more common on the sides than the median portion of jaw,—that the only examples recalled by us of a growth beginning on one side, passing across the median line, are, first, the case termed by Prof. Gross‡ hematoid tumor, which began on left side just behind cuspid tooth, and passed across the line of symphysis as far as the lateral incisor of the right; and second, the one described by Mutter,§ which occupied the symphysis and about two-thirds of the left ramus of the bone. Hyrtl|| alludes to a case of exostosis of the symphysis.

(b) *The lower jaw as divided into the alveolus as one part and the remainder of the bone as another.*—This division is an important one to remember, for the following reasons: The alveolus is developed with the teeth and disappears with the teeth; it is an outgrowth from the jaw for a specific temporary purpose. Jno. Hunter¶ declared that the “alveolar processes of both jaws should rather be considered as belonging to the teeth than as parts of the jaws.”

It will follow that all diseases of the alveolus are to be considered as dental in their significance. Thus epulis is peculiarly an alveolar disease. A tooth in any portion of the jaw other than that of the alveolus is as much out of place as though it were lodged in another bone. There is little doubt that the position so often assumed by the third permanent molar at the end of the alveolus, half within and half without the dental arch, with its roots, it may be, deflected within the compact and resisting tissue of the base of the coronoid process (see

* Atlas, pl. xxxii. fig. 1.

† System of Surgery, i. 485.

‡ Topog. Anatomie, i. 324.

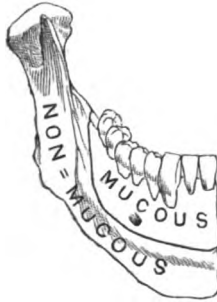
† Trans. Path. Soc. London, xvii. 243, pl. 10, xii.

§ Amer. ed. of Liston's Surgery, 299.

¶ Palmer's Hunter, i. 4.

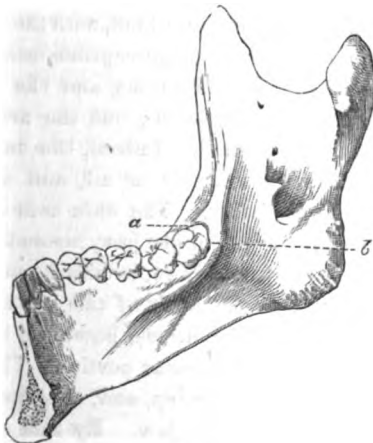
Fig. 12, *a, b*), acts there as a foreign body; and as a splinter in the flesh provokes inflammation, so such a tooth is of necessity a fertile cause of diseased action about the angle of the jaw. Should a tooth be lodged

FIG. 11.



beneath the alveolus, as in the encysted form, it either gives rise to chronic abscess or provokes those common tumors, the odontomes, which frequently are of such fearful import. Cystic disease about the angle of the jaw is so often excited by a misplaced third molar that the teeth should always be examined in diagnosing this condition. In a case mentioned by Bordenave,* foetid matter from the collection escaped after removal of the second and third molars.

FIG. 12.



Dr. Mason Warren† has described a number of cases of cystic tumor of the angle of the jaw. In one of these the growth began by a swelling at the root of the third molar of the right side. By the end of several

* Surgical Essays, Sydenham Series.

† Surgical Observations, with Cases and Operations. Boston, 1867, 72.

years it involved the whole right ascending ramus. It was of a globular shape, extended back under the lobe of the ear, and forward to encroach upon the cavity of the mouth. In another the growth extended backward into the parotid region, upwards upon the face, "inwards to involve the right half of the palate, where it was covered by a highly irritable œdematous mucous membrane resembling that covering malignant growths in the same locality." There was a slight discharge of fluid through the remains of the socket of the last molar. This being enlarged, the cystic character of the growth was made clear. In a third instance, a growth of six years' duration, which attained the size of a hen's egg, began in the socket of the third molar.

It would be interesting to trace the connection between defects of the teeth-germs and congenital cystic tumor of the lower jaw, such as is described by Coate,* occurring on the right side of the lower jaw of an infant three months of age. It was operated upon. Death ensued from exhaustion.†

That the body of the jaw is a distinct growth from the alveolus is shown in the study of cases of congenital defects of the bone. In the following rare manifestation of imperfect development characterized by permanent fixation of the two halves of the bone, we have, as the adult condition is attained, the jaw preserving the proportions of the infant so far as the body is concerned, while the teeth and alveolus are as well pronounced as in a normal jaw. Mr. Humphry‡ describes the case as follows:

"The lower jaw is almost completely fixed, with the molar teeth clinched against the upper, so that there is no perceptible interval between them. The jaw is broad or natural at the angles, and the angular parts have descended nearly to their proper level; but the arch formed between the two angles is extremely small. Indeed, the body and the mental portions of jaw run forward scarcely at all, and do little more than pass from one angle to the other. The chin is in a plane two inches behind the alveolar edge of the upper jaw, instead of being a little in front of it. There has been, therefore, a failure, amounting to at least two inches, in the growth of the body of the jaw in length; and it is also less deep than natural. The failure, however, has not been shared in quite an equal degree by the alveolar portion. This forms a segment of a larger circle, taking a wider sweep, and, consequently, overhanging the lower part of the body of the jaw. By this means greater room is given for the teeth, which are as numerous and *as large as natural* ;

* Syd. Retrospect, 1861.

† For a cystic tumor not apparently connected with the teeth, yet apparently strictly alveolar, see R. Adams, Med. Times and Gazette, 1857, 484.

‡ Med.-Chir. Rev., 2 série, vol. xxvii., 1862, 288.

and they are disposed in a slanting fan-like manner, so as to bring the crowns of the molars and hinder bicuspid into contact with those of the upper jaw."

(c) *The lower jaw divided into muscular impressions as one part, and the rest of the bone as the remaining part.*—Both sides of each ascending ramus may be said to be large muscular impressions,—the outer for the masseter, the inner (less completely covered) for the pterygoid muscles, while the tendon of the temporal muscle embraces the coronoid process. The arch of the bone can be called, for the most part, a non-muscular area; for with the exception of the insertion of the digastric muscle at the small digastric fossa, and genio-hyoid group at the genial spine, the muscles here (*viz*, the mylo-hyoid muscle within, at the ridge of the same name, and the depressor anguli oris and the platysmus myoid muscle at the mental process *without*) constitute an unimportant element.

It is particularly with the ascending ramus that we find the muscular impressions of value in the study of lesions and diseased actions. In the first place, the masseter act as external cushions protecting the jaw from direct violence, while the pterygoids act as internal cushions to prevent bilateral dislocation. In the second, the direct influence exerted on the shape of the angle by the internal pterygoid is often very marked. A condition known as incurvation of the angle is frequently seen in well-marked lower jaws. It was at one time thought that this peculiarity stamped the individual as an example of a low type of man. It is a curious fact (only noteworthy from its liability to deceive in attempting such generalizations) that the same incurvation of the angle should be a constant character in the jaw of the marsupials,—the lowest group of the mammalia.

Another feature of importance is the fixity of the ascending ramus by the contraction of the masticatory muscles. All things being equal, the position of elevation or depression of the lower jaw will make the difference between a dislocation and a fracture. If the jaw is elevated, the bone is apt to be broken by direct violence applied to it; if, however, it is depressed, it is more apt to be dislocated. The ensuing case is of value in illustration of the above principle. It is recorded by Mr. J. Thomson.*

The lines of fracture were doubtless determined by the fixed position of the jaw.

A young man whilst plowing was thrown down by his bullocks running away, and the coulter, catching his throat, tore away the entire horizontal portion, and more than half of the right ramus of the lower jaw.

* Edin. Med. Journal, 1861, vii. 587.

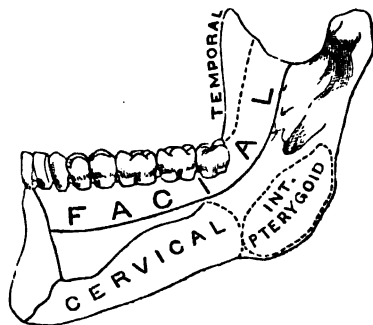
"A lacerated wound extended from the right mastoid process across the throat to nearly the left angle of the jaw; this at its posterior origin had entirely divided the whole breadth of the sterno-mastoid muscle; from the right angle of the jaw to near the chin it divided the floor of the mouth. It was also met by an oblique laceration from the left commissure of the lips, which had quite torn through and divided the cheek. The inferior maxilla was fractured on both sides, on the right more than half way up the ramus. The bone thus broken and torn out of the face was very much denuded of soft parts, and at each fractured extremity was, to some extent, laid bare of periosteum."

Six weeks after injury, the right side of face was paralyzed; the eye could not be closed, nor the mouth entirely.

The specimen embraced the entire horizontal portion of jaw, and more than half of the ramus of right side. The ramus had been fractured obliquely backwards and downwards from the root of the coronoid process to the middle of the posterior edge. On the left side the fracture extended obliquely across the angle, from behind the socket of the second molar tooth to just in front of the posterior part of the angle of the jaw.

According to Hamilton,* fracture of the condyloid process almost always occurs just below the insertion of the external pterygoid muscle.

FIG. 13.



(d) *The lower jaw as divided by the mylo-hyoid ridge into two groups of relationships—one above (facial), the other below (cervical).*—The mylo-hyoid muscle is the floor of the mouth, and abruptly separates the inner aspect of the curve of the body (from the free inferior border to the ridge) from the rest of the bone. The relations of this region are entirely with the neck. We will resume its consideration under the caption of the supra-hyoid space.

(e) *The lower jaw yields certain points of comparison with a long*

* Treatise on Fracture and Dislocation.

bone.—The lower jaw resembles a long bone in having compact bone *without* and cancelli *within*,—in having a well-defined canal (somewhat comparable to a nutritive foramen) entering it obliquely, and, moreover, it has an active periosteum, which tends in necrosis to produce an involucrum.

It conspicuously differs from a long bone in the absence of an epiphysis. The bone is thus deprived of an epiphysal period, which is so prolific in morbid processes. The *ends* of the lower jaw (*i.e.* the articular surfaces) are peculiarly exempt from disease, the very opposite to what is seen in long bones. The only instance of restricted disease at these points known to us is in a specimen of caries, with subsequent hyperostosis, preserved in the collection of the Philadelphia Dental College. Hydrarthrosis is equally rare. Mr. Tatum* briefly describes a *unique* case of fluid in the temporo-maxillary articulation escaping into the external meatus following a lesion of the latter.

The lower jaw also differs from a long bone in its contact with mucous membrane. When in fractures of the lower jaw the gum is deeply lacerated, the fracture at once becomes compound. The ease with which this can occur, and the consequent frequency of this occurrence, places maxillary fractures in a group entirely distinct from those of other bones. It has been asserted (and on good grounds) that the contact of the air and saliva between the ends of the broken bone tends to provoke otitis, suppuration, with their sequelæ, constitutional disturbance and increased risk of pyæmia.

Again, the methods of securing vascular and nervous supply are widely remote from one another. In the lower jaw it is by a canal which is primarily a groove in the embryonic bone, and which in necrosis is probably included in great part within the thickened osteogenetic periosteum. The dental nerve and vessel are designed, in a word, for a special object within the jaw, as well as giving blood and nerve-supply to the bone; thus holding the same relation to the jaw that the hepatic artery and nerve hold to the liver. The lower jaw is, independently of the teeth, not a very vascular bone. It succumbs readily to attacks of necrosis, as much from this cause as from its peculiarly exposed situation.

The otitis preceding necrosis of the lower jaw is almost always more marked than in a long bone, and the pain is greater. The latter symptom often resembles that of intermittent toothache,† thus complicating the diagnosis. The swelling of the cheek and gums, the difficulty in mastication, and the dysphagia, as well as the increased activity of the mucous and salivary glands, are distinctive symptoms. The

* Lancet, 1860, ii. 536.

† Howship, Pract. Surg., 1816, 17.

presence of a sequestrum may, according to Butcher,* induce vomiting and difficulty in speech and swallowing. In a word, we have as a result of a branch of a cranial nerve being held in connection with the products of inflammation,—if it be not itself inflamed,—an excitation of a larger circle of sympathies than is possible within a long bone.

T. Holmes† mentions the occurrence of fatal hemorrhage from the lingual artery excited by a maxillary sequestrum.

The position of necrosis of the lower jaw, as a sequela of diseases such as measles, scarlet fever, smallpox, and typhoid fever,—diseases whose lesions are for the most part splanchnic,—are in themselves of supreme significance, compared to which nothing can be seen in the long bones. The same remark is true of that disease, now fortunately rare, phosphor-necrosis. It will be remembered that this disease always invades the jaw through a carious tooth or open socket,—proving not only that the direct contact of the poisonous agent with the cancelli is requisite, but that such contact is *possible* only in the jaws; for no such relationship of cancelli to an open surface is ever seen in a long bone. A transverse section of the compact structure of the jaw may be compared to a vase. The base of the vase is firm and thick; the sides become thin as they approach the brim, while the upper surface is open. The vase is occupied by teeth and adjacent cancelli. If a tooth is removed, the cancelli are at once exposed. Applying this explanation to the shape of sequestra, it will be seen that a sequestrum of the lower jaw or an exfoliation from the ends of a broken bone must be more or less U-shaped, as the same specimens from a long bone are more or less cylindrical. This rule does not apply to syphilitic necrosis.

According to Stanley,‡ nine months are required to restore a lower jaw through the activity of its periosteum after the bone has been destroyed by necrosis.

The comparison between the lower jaw and a long bone is interesting in studying the subject of amputation. The wide range of sympathies seen in otitis and necrosis of the lower jaw is to be expected in excision of that bone. In the event of amputation of a limb proving fatal, we commonly find pyæmia or secondary hemorrhage playing a ghastly rôle. While these prodromes to fatal disaster are unfortunately not wanting in the other operation, we more frequently find erysipelas and shock the exciting-cause to sudden death. In summing up the experience gained in seven amputations, J. W. Casack§ says: "Fatal cases of diffused inflammation succeeding to operations in the vicinity

* Essays and Reports on Operative and Conservative Surgery. R. G. Butcher. Dublin, 1865, 307.

† Holmes's System of Surgery, iii. 615.

‡ Trans. Path. Soc. London, iii. 169.

§ Dub. Hosp. Rep., iv., 1827, 1.

of the base of the lower jaw are by no means unfrequent." In one of his cases, the erysipelatous inflammation involved the parts about the larynx, death ensuing on the ninth day after the operation. Mr. Symes* narrates a case of excision which proved inexplicably fatal on the second day.

(f) *The lower jaw as determining the localization of tumors.*—From an anatomical standard, this subject, of great intricacy in other relations, resolves itself into a few simple propositions.

1st. When a tumor originates within or beneath the gum and involves the cancelli secondarily, it indubitably belongs to the alveolar group of morbid growths. The different varieties of epulis are thus anatomically restricted.

2d. Fibrous tumors, according to Nélaton, may either arise within the body of the bone, when by their growth they will encompass the bone, or, taking their origin beneath the periosteum, they protrude toward the affected side. The same writer affirms that they tend to develop toward the cutaneous rather than the mucous (oral) aspect of the bone. Fergusson† describes a fibrous tumor which lay enclosed within the expanded and attenuated tables of the jaw. The central encapsulating fibrous tumor may involve the dental nerve, as described by T. Bryant‡ in a tumor which was removed from the left side of the body of the lower jaw of a boy nine years of age. It was of two years' duration, and followed a blow received six months before. The nerve was found running through the center of the growth. It would appear that encephaloid disease may originate in the dental canal, judging by the case reported by Nunneley.§ in which the disease was ushered in by numbness of the left side of the lower lip. This was followed by varying pains in the canine and two adjoining teeth of the same side. The last molar was extracted with a view of relieving the toothache. The nature of the case now became evident, and it progressed rapidly to a fatal termination.

3d. The lower jaw being in the line of growth of epithelial tumors of the lower lip, secondary cancers from that source are not infrequently seen. In a case coming under our notice in private practice, the disease had progressed from the lip along the line of the right side of the horizontal portion, opening the oral cavity from the side and destroying the alveoli. The tongue, thus deprived of lateral support, lolled outward, and the saliva dropped continually upon the neck. Fortunately, these extreme degrees of destructiveness are rare, but the probability of secondary involvements of the lower jaw from neglected epithelial cancer should never be overlooked.

(To be continued.)

* Surg. Contributions, 21. † Medical Times and Gazette, 1865, 141.

‡ Trans. Path. Soc. London, 1858, 352. § Ibid., xiii., 1862, 215.

THE DISTINCTIVE CHARACTERS OF ANIMALS AND VEGETABLES. BEING PART OF AN INTRODUCTION TO THE STUDY OF PHYSIOLOGY.

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(Concluded from page 7.)

FUNCTIONS OF ORGANIZED BEINGS.

A *function* may be defined as an *action* or *office* performed by a living being or its parts.

The number and variety of these functions increase with the complexity of the creature in which they reside, but there are certain general functions which have for their object the maintenance of the life of the individual, the perpetuation of the species, and keeping up necessary relations between different parts of the same being, and between it and other objects of creation.

These functions are divided into two great classes, the *Organic* and *Animal*.

I. The **ORGANIC OR VEGETATIVE OR VEGETAL FUNCTIONS** are those common to animals and vegetables, and are intended to preserve the life of the individual and secure the perpetuation of its species. They are further subdivided into—1. *Nutritive*, having the former object, and including Digestion, Absorption, Circulation, Respiration, Nutrition, Secretion, Calorification; 2. *Reproductive*, including Generation, and having for its object the preservation of the species.

II. **ANIMAL FUNCTIONS OR FUNCTIONS OF RELATION** are peculiar to animals, and are those through which the interdependence of their various organic processes—the peculiar relations of animals to each other and to the remainder of creation—is kept up. They are due to the presence of a nervous system, and include Sensation, Voluntary motion, Mental and Moral manifestations.

I. It remains to show briefly how the different organic functions are common to both animals and vegetables, and thus complete the comparison between the two kingdoms, by presenting some points of resemblance as well as contrasting differences.

1. *Digestion*, or the preparation of food for absorption. Although, as has been stated, the vegetable is not provided with any apparatus in which alterations at all comparable to those which take place in the animal kingdom, or even for the solution of organic material accidentally detained there, as has been claimed for the pitchers (*ascidia*) of *Sarracenia*, or *Nepenthes*, and the traps of *Dionæa*, yet the single fact that these afford receptacles for the collection of water and inorganic matter therein dissolved, proves a general similarity of function sufficient for our purpose.

2. *Absorption*, the process by which alimentary materials enter the circulation, is accomplished in animals and vegetables by a process of imbibition which is identical in both. The phenomena of osmosis which underlie it will be fully considered later. While there are low forms of creation in both kingdoms in which this absorption takes place from the surface indifferently, the specialized organ seen in the root and its terminal *spongiole* is entirely comparable to the special apparatus present in the villi of the small intestine of the animal.

3. *Circulation*, or the process by which the nutrient sap and blood, together with their contained oxygen, are carried to different parts of an organism, is a function common to animals and vegetables. While there is the same degree of simplicity of apparatus, or of utter want of apparatus,—circulation being a simple transmission from cell to cell in certain low forms of both kingdoms,—the complexity of the circulatory apparatus of the higher animals is very much greater than that of the higher vegetables. The latter are, however, supplied with vessels, and Dr. J. G. Hunt of this city has recently demonstrated a net-work of capillary vessels in the leaves of *Euphorbia ipecacuanha*, *E. maculata* and *E. corollata*, which is almost identical with that of animals.

4. *Respiration*, or the aeration of the nutrient fluid, and the removal of carbonic acid therefrom, is in the vegetable a process identical with that in the animal, though the respiration of the plant is apt to be confounded with its feeding. In it the leaves are the lungs; and the process consists, as in the animal, in an inspiration of oxygen and an expiration of carbonic acid. It is well known, on the other hand, that the plant consumes largely of carbonic acid, of which it fixes the carbon and gives out the oxygen; and since the latter operations far exceed the former in extent, it follows that the plant is thus a carbonic acid consumer and an oxygen producer. This is, however, not the respiration of the plant, in which, as stated, it consumes oxygen and gives out carbonic acid. Again, the plant, while it respire during day and night, feeds only under the influence of the sun's rays, so that at night it is purely an oxygen consumer, and as such deteriorating the quality of the air in our apartments, while during the day it improves it.

5. *Nutrition*, by which the alimentary matter is converted into the tissue of the living organism, and acquires its properties, is an identical process in the animal and vegetable, though the precise steps of the operation have not been determined in either instance. In the vegetable, however, it will be recollected that it begins a step farther back, in that the food originally supplied to it in an inorganic form must first be converted into organic compounds, whereas these exist pre-

formed in the food of the animal. In each instance, however, these compounds, after admission to the circulation, become the seat of certain changes of endowment, by which they approach the condition of living tissues. Thus results the "protoplasm" of the plant and the "liquor sanguinis" of the blood, which differ signally from the gum, albumen, and other organic compounds, which are not organizable until thus altered. The properties thus acquired are known as vital properties, and are commonly believed to be derived from the tissues through which sap or blood is passing, or from the cells floating in the stream itself.

6. *Secretion*, by which certain elements are removed from the juices of an animal or plant, and deposited for further use as *secreta*, or altogether thrown aside as *excreta*, is easy of illustration in the plant; for we have only to refer to the various colors and odors so richly furnished by the vegetable kingdom, to be enabled to note the complete analogy. And although we have nowhere in the plant that complication of apparatus with which we are familiar in the animal, vegetable histology affords instances in which the most perfect glands are differentiated, as those described by Dr. J. G. Hunt, of this city, in the bottoms of the pitchers of *Nepenthes destillatoria*, in the processes of the leaves of the *Dionæa muscipula* (Venus's fly-trap), which secrete the fluid therein constantly present, and in the *Drosera rotundifolia* (Sundew), where are found three kinds of glands of most beautiful structure.

7. *Generation*, the function through which the species, rather than the individual, is perpetuated, is essentially the same in both kingdoms, requiring the union of the germ cell with the sperm cell to accomplish the fertilization of the former; but while the means by which this is accomplished are in some instances strikingly similar, in others they are widely different.

II. The *animal functions*, on the other hand, are peculiar to animals only. In the first place, however, it is important to remember that although *muscular contraction* is peculiar to animals, and therefore an animal function, this is not the case with *contractility*. We are already familiar with an instance of its presence in the vegetable world, in the sensitive plant, in which we saw abundant manifestation in response to stimulus, wherein we cannot fail also to perceive *sensibility* or irritability, although this is something very different from *sensation*, an animal function dependent upon nerves for its exercise. In the lowest animals, also, we have the well-known *sarcode* substance of Dujardin or *protoplasm* of Max Schultze making up their entire bodies, to which was early assigned the property of "irritability without nerves," and which is also "irritability without muscle," there being nothing like muscle in the structure of these organisms.

Through the nervous system, and the functions arising from its presence, the body is enabled to take cognizance of external operations, with or without consciousness of them; and through its relations with the muscular system to make them the subject of further operations.

As already stated, *moral* manifestations are peculiar to man, constituting the cardinal characteristic by which he is distinguished from the so-called brute creation, to which must be allowed *mental* manifestations, at least in their general significance. And it is through these moral attributes that man is enabled to conceive the Good, the True, and the Beautiful, and to comprehend also the existence of a Supreme Being. These are conceptions of a highest intelligence, and by these man signalizes himself rather than by a more perfect physical organization.

Again, we have seen that all the various organic functions are common to animals and vegetables. Yet a moment's consideration will inform us how widely different are the means, and how different the degree of complexity of the organs by which they are accomplished in animals. This complexity becomes more marked as we ascend the scale of organization, and it is through the nervous system that these different operations are harmonized, and the necessary differentiation or specialization of organs is permitted.

The science which has for its object the study of living beings, whether of the animal or vegetable kingdom, is known as BIOLOGY, the extent of which is only commensurate with that of these kingdoms. It becomes necessary, therefore, to limit ourselves to that branch of Biology which more immediately concerns us. Physiology itself is a study which is coextensive with living things, though of course less so than Biology, since it only treats of living beings in action. Still further limitation is therefore necessary. Provision for this is made in the use of limiting terms prefixed to the word Physiology. Thus we have *general physiology*, *vegetable physiology*, *animal physiology*, *comparative physiology*, *human physiology*, etc.

GENERAL PHYSIOLOGY treats of the healthy functions of organized beings, in an abstract and philosophical manner; VEGETABLE PHYSIOLOGY of the normal functions of vegetables; ANIMAL PHYSIOLOGY of those of animals; while COMPARATIVE PHYSIOLOGY treats of the healthful phenomena of both of these in comparison with each other and with man. HUMAN PHYSIOLOGY may be defined as *the science which treats of the functions of human beings in a state of health*.

A term, of which students in the very beginning of their studies should also have a clear idea, is PATHOLOGY, which may be defined in its broadest sense as the science treating of the phenomena of living beings in a state of disease, or, in two words, diseased physiology.

A LECTURE ON THE TRUE NATURE AND ORIGIN OF THE SALIVARY GLOBULES, AND THEIR IDENTITY WITH THE WHITE CORPUSCLES OF THE BLOOD.

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(Delivered before the Odontographic Society of Pennsylvania, Nov. 5th, and before the Pennsylvania Association of Dental Surgeons, Dec. 9th, 1873.)

(Concluded from page 21.)

UNDER a microscope affording a power of two hundred and fifty diameters you will soon discover, on attentive examination among the piles of red corpuscles which cover the field, some five or ten roundish, oval, or irregularly-shaped masses of grayish-white color and finely-granular aspect, contrasting in both these qualities in a marked manner with the homogeneous yellowish-red disks. These are the white blood-corpuscles or leucocytes, which may be studied, and their wonderful amœboid movement recognized, under a quarter-inch lens, but require for their satisfactory investigation a $\frac{1}{6}$, $\frac{1}{8}$, or $\frac{1}{10}$ immersion objective.

The white cells of the blood were first distinguished from the red disks by Hewson, about 1775, but do not appear to have attracted much attention from pathologists until near the middle of the present century, when William Addison, in 1843, published his second series of experimental researches on the actual processes of nutrition, in which he asserts their importance as constituting the cellular elements of both tissues and secretions. His observations were followed by those of Wharton Jones and Augustus Waller, in 1846; Von Recklinghausen, who examined the amœboid motion of leucocytes in 1863; Max Schultze, who studied these remarkable movements under the influence of artificial heat in 1865; and Cohnheim, whose great doctrine of inflammation, as the result of a "wandering out" of "migrating" white corpuscles, through the stomata of the vessels, was promulgated in 1867, since which time the leucocytes of the blood have been special objects of investigation to microscopists throughout the world.

This remarkable discovery of Cohnheim, affording the second great link in my chain of argument to prove the identity of the salivary and white blood-corpuscles, by demonstrating how the latter make their way through the vascular walls, and, wandering through the tissues, are set free in the oral cavity, is briefly as follows:

In the course of his investigations upon inflammation, Prof. Cohnheim found that if we take a frog paralyzed by the injection of curare (the South American woorara) or of chloral, and, incising the abdominal parietes, draw out a portion of the intestine, so that the thin membrane of the mesentery can be spread out beneath the microscope, it is easy

to watch the whole inflammatory process (which is soon set up, in consequence of exposure to the air) from its very commencement.

After the primary steps of inflammation, namely, the irregular dilatation of the vessels and the slowing or complete stasis of the blood-stream, well known to older experimenters, we observe that the leucocytes roll lazily along upon the inner surfaces of the smaller veins (and to a less extent of the arteries), where they soon begin to adhere.

On fixing our attention upon one of these adherent white blood-cells which is favorably placed for observation, we may see that in a short time it begins to display the curious amœboid movement, shooting out a tongue-like process apparently into the wall of the blood-vessel, but in reality into one of the minute pores or stomata which, as I shall show you presently, everywhere stud the boundaries of the vascular system. Continuing our scrutiny, we observe that this tongue-like projection of the substance of the blood leucocyte becomes club-shaped or knobbed at its outer end, and that this bulging of the extremity goes on increasing, the main mass of the leucocyte meanwhile diminishing in an inverse ratio, until the whole corpuscle assumes a dumb-bell shape, one of the terminal dilatations being within, and the other outside of the vascular wall. Finally we notice that the internal knob of the dumb-bell grows smaller, whilst the external one becomes *pari passu* larger, until the former entirely disappears, and the connecting band or bridge (corresponding to the shank of the dumb-bell) being likewise ultimately withdrawn into the main mass of the corpuscle, the entire leucocyte severs all its connection with the blood-vessels, whence it has thus emigrated, and we may see it wander away among the connective-tissue cells, which go to make up the substance of the surrounding structures.

The stomata or pores of the finer blood-vessels, to which I have already alluded as playing such an important part in this process, as giving exit to the migrating leucocytes, are minute apertures, varying from $\frac{1}{16,000}$ to $\frac{1}{26,000}$ of an inch in diameter, and occurring at the lines of junction of two or three of the broad irregularly-shaped epithelial cells which form the endothelial lining of the vascular system. They are best demonstrated by tinting these endothelial cells with $\frac{1}{2}$ per cent. nitrate of silver solutions; and I show you here an exquisite photograph of such a preparation, for which I am indebted to my friend Col. J. J. Woodward, of the Army Medical Museum at Washington. In it (No. 3378 Microscopical Section) you see the irregular zig-zag lines of junction of the endothelial cells, reminding one of the sutures in the cranial bones, and at certain points, designated by pencil-lines, the holes or stomata which have just been described.

I am accustomed to demonstrate this most important part of the

inflammatory process to my classes in Pathological Anatomy at the University of Pennsylvania, by the simple models you see here.

In this ball of soft putty you have an almost exact representation of a white blood-corpuscle when magnified 5000 diameters; and if you examine a favorable specimen of the living leucocyte, on a slightly-warmed slide, as already suggested, you will see it after a short time (as I show you here) desert its globular shape by sending out a tongue-like process, and then gradually growing into this, as it were, until, passing through the dumb-bell and tadpole forms, it may resume its spherical shape, after traveling a distance equal to its own length across the field. This snail- or worm-like motion is the wonderful amoeboid movement of which you hear so much, and which it is capable of performing continuously, under favorable circumstances, for a period of at least two days after being deposited upon a glass slide.

Under comparatively low powers, such as the $\frac{1}{4}$ or $\frac{1}{8}$ inch objective, giving an amplification of 200 or 250 diameters, it is difficult to see all the steps of this movement of the leucocyte; but by close watching it is quite possible to detect slight modifications of shape, and, after a proportionate length of time, some perceptible alteration of position.

To illustrate the entire process of emigration of the leucocytes as seen in Cohnheim's experiment, I will ask your attention to this tin tube, about three inches in diameter and eight inches long, upon whose exterior I have painted the outlines of the endothelial cells (with their nuclei stained with carmine), *as they actually existed* in the small vein from which Dr. Woodward took the photograph already shown you. At one point I have perforated the tin (just as one of the stomata does the coat of the blood-vessel), and through that aperture you can see me thrust a small ball of putty, representing a white blood-globule on its way as it "wanders out" to constitute a corpuscle of pus. During its journey, from the inside to the outside of the vein it assumes, you observe, first a tadpole shape, with the tail pointing externally, then a dumb-bell or hour-glass outline, and finally a caudate form again, with the tail directed internally, however, exactly as I have described to you the leucocytes do in the celebrated investigation of Prof. Cohnheim.*

* A comprehension of this "wandering out" of the leucocytes enables us to explain the various phenomena of inflammation, about the mouth as well as elsewhere, with wonderful beauty and clearness. Thus, for example, when you attempt to fill the pulp cavity of a tooth after destruction of the nerve in the root, and before the irritation in the stump of that nerve has subsided under treatment, the gradually-increasing pain felt by the patient is due simply to the escape of twenty, fifty, or perhaps a hundred thousand white blood-corpuscles, which wander out through the stomata of the vessels, as I have demonstrated above. Since these must have room in the bony canal into which they emigrate, they necessarily compress

Now, gentlemen, when you remember that in order to permit of this emigration of the white blood-cells it is not necessary that actual inflammation, with complete interruption of the circulation, should occur, but that it may take place as a consequence of partial stasis of the blood-stream during mere congestion, you will, I think, perceive at once that this discovery of the talented German pathologist has within the last few years, and within them only, opened the way for an acceptance of such a theory as mine, by revealing to us a simple and natural method by which the leucocytes of the blood may escape from within the vessels, and, making their way through the thin layer of tissue lining the oral cavity, be set free upon its surface, where they undergo almost immediate distension, and become the corpuscles of the salivary fluid.

But lest there be some skeptical individuals among you, who doubt whether the white blood-corpuscle swells into a salivary globule (because no microscopist has ever seen that entire change in all its stages) without changing *its* identity; and also doubt whether the human ovulum, after it escapes from the Graefian follicle, still retaining *its* identity, undergoes development into a fœtus, *for the same reason*, I have still in reserve a method of proof, which, borrowed as it is from mathematical demonstration, seems to me to afford an approach to mathematical cogency in its conclusiveness.

If a dropsical patient, so swelled by serous effusion that, to use a vulgar expression, his own mother would not know him, wished to establish *his* identity, it is manifest that one of the most available methods would be to get rid of the fluid by which his form and features were distended, and so restore his lineaments to their normal aspect. In like manner it occurred to me that if we could withdraw that excess of fluid (carried by endosmotic action into the leucocyte) which by mere mechanical enlargement causes it to become spherical and to assume the salivary corpuscular form, we would be able to restore to it the well-known aspect of a white blood-corpuscle, and so contribute an important item of evidence to the support of my theory. An investigation like this would, as has been remarked in an editorial upon the subject in the DENTAL COSMOS, "seem to adapt to the solution of the

the remaining nerve-tissue at the foramen, and cause, as mechanically as the atrocious thumb-screw of the inquisition, first the tension, then the pain, and finally the excruciating agony which attend an abscess at the root of a tooth. Of course the obvious remedy of removing the plug and giving exit to the tiny drop of pus (made up of these emigrating leucocytes) acts not by preventing white blood-corpuscles from wandering out at various points of the inflamed vessels, but by obviating that *painful pressure* which these little wanderers seem to have the power of producing whenever and wherever imprisoned, and so restricted in the exercise of their extraordinary amoeboid movement.

problem the schoolboy's method of proving a sum in simple addition, by subtracting from the total one of its constituent quantities, and obtaining the other as a remainder."

Such indeed is the case, as is proved by the following experiment, which I likewise beg any doubters to repeat, and verify or disprove for themselves.

In the course of investigations upon the character of the white blood-corpuscles in my report above mentioned, I removed a small portion of tartar from between two of the molar teeth, placed it upon a slide, and adjusted it beneath the microscope as already described for examination. After some search, a bay-like indentation in the margin of the tartar was found, occupied by a mass of some fifty salivary corpuscles, nearly all exhibiting the dancing motion of their molecules in great perfection. On introducing a current of the three-quarter per cent. common salt solution (by means of the thread syphon as explained in an early part of my lecture) these globules rapidly *contracted*, the molecular movements in their interior ceasing, when they were about $\frac{1}{2500}$ of an inch in diameter, in a reluctant manner, apparently in part because the granules had no longer space to vibrate in the contracted corpuscles, and in part because the fluid in which they floated within the leucocytes became too viscid to permit such vibration. When the salivary globules were reduced by this abstraction of water to a diameter of about $\frac{1}{2500}$ of an inch, well-marked and unmistakable amœboid movements were seen to occur in several instances; and since this power of amœboid motion is the most characteristic property of the white blood-corpuscles, I thus obtained the same kind of proof of their identity with the blood leucocytes which our supposed dropsical patient would do if by a course of diuretic medicines he were to get rid of the superfluous water, and regain his original form and power of movement.

From these various data I deem we are justified in concluding that, tracing the white blood-corpuscle from its condition of irregular outline and amœboid movement as observed in the liquor sanguinis and in heavy urine, through its rounded form with slightly more distinct nuclei in the liquor puris of pus not perfectly fresh, and in urine of lower specific gravity, we find that, immersed in a rarer liquid approximating to the mean density, or at least the osmotic power, of saliva, it has an accurately spherical outline, is more than twice its original magnitude, and contains a number of minute actively-moving granules, thus exactly resembling in all sensible characters the true salivary corpuscle. Hence I maintain "that the blood under the appointed nervous influence, congesting the buccal mucous membrane and associated glands, moves slowly enough through their capillaries to allow some of its white globules to penetrate the walls, as they are seen to

do those of the frog's mesentery in Cohnheim's now celebrated experiment." Further, that these very leucocytes, after coming under the influence of the rarer saliva, which expands them and sets free to move their contained molecules, "constitute the bodies so long known to histologists as the corpuscles of the salivary fluid."

My researches heretofore alluded to lead me to conclude that the white blood-corpuscle (which I hope you are now all willing to recognize and desirous of studying as a *non-dropsical salivary globule*) is a cell, composed of, in the first place, a nucleus (or nuclei) which possesses the power of independent amœboid movement, and is insoluble in water, but capable of slowly imbibing that fluid until swollen to nearly double its normal size. The cell wall of the corpuscle is a membranous envelope insoluble in water even when boiling, too thin to exhibit a double contour with a magnifying power of 1200 diameters, but firm enough to restrict the movement of its contained granules within its limits. Its exterior is adhesive, so that surfaces or particles coming in contact are liable to become attached thereto. Some phenomena observed lend countenance to a theory that these membranous parietes are dotted with minute pores, which permit delicate threads of the inclosed soft protoplasm to be extended, and that the edges of these foramina, if the projection still continues, are carried outwards during the amœboid movement, forming a sheath to all except the extreme point of the tongue-like process. The material occupying the space between the capsule and the nucleus, denominated the protoplasm of the cell, is a soft jelly-like matter, in which chiefly resides the capacity of amœboid motion. The protoplasm seems to be soluble in water and saline solutions in all proportions, and when freely diluted loses its amœboid power, which, however, is strangely enough regained in a majority of instances when the excess of liquid is removed.

The laws by which leucocytes take up and part with their fluid seem to be simply those of the dialysis of liquids through animal membranes, by endosmosis and exosmosis, as investigated by Graham in 1855; the rapid inward current from the rare solution, or at least the solution of high diffusive power, through the cell wall, distending that membrane and diluting the contained fluid, until an equilibrium of the endosmotic and exosmotic flow is attained, or the capsule is burst by the centrifugal pressure of accumulated liquid.

The structure of the particles which exist in the protoplasm and exhibit dancing motions when the latter undergoes dilution is yet undetermined, although sundry facts indicate that their movement is not dependent on "vital" causes, but is merely a molecular one, also that some of them at least are minute granules of fatty matter, which after a time may coalesce into visible oil globules, as in the older pus-corpuscles. In regard to any difference of their motion in the salivary

bodies, my experiments so fully and uniformly corroborate each other that, reluctant as I feel to dispute the assertions of such celebrated histologists as Stricker and Pflüger, I cannot but call in question the general correctness of their statement upon this point, for it is manifestly inaccurate to affirm, as they do, that a half to one per cent. salt solution still permits the "dancing" movements of fresh pus- or lymph-corpuscles to continue, whilst it abolishes those of the salivary globules, when the fact is that the motion ceases in nineteen out of every twenty corpuscles under its action; just as it would be erroneous to maintain that quinine does not stop the course of ague, because in one case out of twenty it fails to prevent a recurrence of the chill.

Touching the vexed question of a cell wall to the leucocytes of blood, pus, saliva, etc., I may remark that although Stricker and Brücke express themselves with such decision in recent papers respecting the necessity of detecting a double contour at the periphery of a cell before the presence of an investing membrane can be admitted, it seems to me that the recognition of such a duplicate outline is a question not solely of the existence of membrane, but also of its thickness. It will, I presume, be readily acknowledged that many films of tissue exist in animal bodies, as for example the arachnoid during foetal life, which are of such tenuity that in a transverse section the naked eye or even a magnifying power of ten diameters can discern but a single contour; and yet no man in his senses will deny that such membranes have a positive existence. Furthermore, histology teaches us that other membranes occur, which are but one-half or even one-tenth the thickness of the human arachnoid. These consequently can exhibit but a single contour when magnified twenty or one hundred diameters respectively, and yet it is easy to demonstrate that they are real, not imaginary, structures. Since, therefore, our knowledge does not warrant us in asserting that membranes must *necessarily* be more than $\frac{1}{100}$ of an inch in thickness, any more than we are able to say that hairs must be over $\frac{1}{100}$ of an inch in diameter, or they do not exist, I cannot think that inability to detect, with the lenses now in use, both an inner and outer border to the boundary of a cell, is sufficient foundation for denying the presence of a proper cell wall, and believe this difficult question must be determined, if at all, by other and independent testimony.

Of such decisive character are, it appears to me, the dancing movements in certain cases, where, but few molecules being present, individual particles may be selected for observation, and (as I have frequently noticed) distinctly seen to swim rapidly in a centrifugal direction until they strike the single contoured boundary line of the cell, from which they *rebound* sometimes for a distance equal to one-fifth the whole diameter of the corpuscle. Also I think the surprising

rotary motion which I have described as occurring after the action of ferrocyanide of potassium solution even more conclusive, for it appears almost incredible that both molecules and nuclei could quickly revolve within the limits of a cell, unless they floated in very liquid cell contents, or again, that a cell made up of fluid so rare as to permit particles to move through it with such velocity, could either retain its oval shape or restrain its rotating molecules within its limits, except by the aid of a membranous wall of considerable firmness. To recur to a simile which I have elsewhere used in reference to the red blood-disk, it seems to me that this hurried rotation of granules and nuclei inside of a white blood-corpuscle furnishes the same kind of proof that it possesses a cell wall, as the swimming of a shoal of little gold-fish around the inner surface of their vase affords us, first, that they float in liquid instead of being imbedded in jelly, and second, that *they* are confined by a boundary wall, firm enough, not only to prevent them from passing beyond its limits, but also to retain its shape, in spite of the pressure of the liquid within its cavity.

Summing up now the results of these various researches, you perceive that, supposing my observations be correct (as I hereby offer to demonstrate they are, to any one of you, on a suitable occasion), I show first by my own experiments that white blood-corpuscles as drawn from the vessels, if submitted to the action of diluted serum, assume the form and characters of salivary globules; second, by the aid of the investigations of Cohnheim and others, I point out an obvious way by which these same white blood-corpuscles constantly escape from the blood-vessels, and make their way into the salivary fluid; and lastly, prove by direct experiment the converse of my first proposition, namely, that salivary globules, when exposed to the influence of a stronger salt solution having the exosmotic power of the blood serum, contract to the size of white blood-corpuscles, and take on (rather let me say *resume*) their characteristic amœboid movement. I therefore conclude that my theory, first propounded in 1869, that the corpuscles of the saliva are "migrating" white blood-globules, which, "wandering out" into the oral cavity, have become distended by the endosmosis of the rarer fluid in which they float, may now be considered established upon a firm experimental basis.

Finally, let me remark that, although some persons may be inclined to query of what benefit this item of information in regard to the salivary globules will be to practitioners of dentistry and other medical men, I have no doubt that, either alone or linked with other facts, it will soon cast some light upon pathological processes in the mouth which are now more or less obscure. It is related that upon a certain occasion, some one, in the presence of the celebrated Coleridge, undervalued the importance of a new discovery, by exclaiming "What of it?"

it is of no use to the world," and that the poet justly rebuked this caviller, by asking him "Of what use is a new-born child?" A hundred and forty odd years ago the same question might have been put to Augustine and Mary Washington about their infant, then, as the great dramatist describes it, "mewling and puking in his nurse's arms," the new-born son of their house; and at that moment the acknowledgment must have been made that he was absolutely of no use in the world; yet if we look abroad to-day at the millions of free, happy, and industrious citizens who crowd the farms, the factories, the workshops, and the commercial marts throughout the length and breadth of our Union, the answer comes to us with trumpet tones that the man who developed from that child was, through the providence of God, in his day and generation, the most useful that the world has ever seen.

And so, gentlemen, is it with *all* the apparently useless researches of philosophers into the arcana of nature. We can never foresee what advantage a consciousness of any particular "downright fact" will be to us in the dim and distant future; but "*Knowledge is always power,*" and we may be sure that every honest and faithful observation of physical phenomena which arise from the action of those unchangeable, but infinitely various and conflicting laws that govern force and matter, will sooner or later, directly or indirectly, contribute towards extending that knowledge of man, in his countless complex relations, which constitutes the proper study of all mankind.

DILACERATION, OR FLEXION OF THE CROWN OF A LEFT SUPERIOR CENTRAL INCISOR.

BY J. H. M'QUILLEN, M.D., D.D.S.,

PROFESSOR OF PHYSIOLOGY IN THE PHILADELPHIA DENTAL COLLEGE.

(A communication presented to the Biological and Microscopical Section of the Academy of Natural Sciences of Philadelphia.)

A UNIQUE abnormal specimen was recently sent to me by J. M. Comegys, M.D., of St. Albans, Vermont: a left superior central incisor, the crown of which was bent at right

FIG. A. FIG. B.



angles with the root. The accompanying illustrations, natural size, present what would have been, in a normal tooth, the labial (Fig. A) and palatine (Fig. B) surfaces of the crown. The enamel on the labial side is rough, defective in structure, and having a number of brownish

depressed spots on it, while at the neck there is a marked concavity, with the dentine exposed, and presenting the same brownish appearance. On

the palatine surface the enamel is more perfect in appearance and structure. The root is constricted at its neck, stunted in growth, and does not compare in size with the crown. The history of the case presented by Dr. Comegys is as follows: The patient from whom the tooth was removed, when a child four years of age fell and knocked out the left superior deciduous incisor, sustaining at the same time some injury of the surrounding parts. Several years passed over, and all the permanent teeth with the exception of the left superior central incisor made their appearance in due time, but being very defective in structure they were removed and an artificial denture inserted. After wearing this a short period, the patient noticed a fungous or spongy growth of the gum near the center of the upper jaw; on incising this a hard substance was found, which was pronounced to be a portion of the alveolar process. Suffering continued annoyance from this protuberance, the patient called upon another operator, who, also regarding it as a piece of the alveolar process, made an unsuccessful effort to remove it, and the patient at last coming under the care of Dr. Comegys, he extracted it.

The specimen illustrates a condition which John Tomes, F.R.S.,* was the first to direct attention to, and which he describes as dilaceration of partly-developed teeth from the formative pulp. The history of this case is manifestly in support of the explanation presented by Mr. Tomes of the manner in which this abnormal condition is induced, viz., that the peculiar relation which the crown bears to the root is due to the fact that by mechanical violence at a period when the crown of the permanent incisor was partly calcified its position in the jaw was changed so that it was turned outwards or inwards, whilst, the pulp being uninjured, the development of the root continued after the accident, with a permanent displacement of the crown.

Prof. Wedl,† of Vienna, considers that the term "dilaceration was not well chosen;" and his objection is a valid one if the literal derivation (*dis*, apart, and *lacero*, to rend), a rending in two, is applied to the condition. He proposes, in place of this term, flexion or torsion of the crown. While admitting that external mechanical influences such as a blow, kick, or the like, apparently do give rise to flexion of the crown of a tooth during its formation, Prof. Wedl says, "Generally, how-

* Dental Physiology and Surgery, by John Tomes. Philadelphia, Lindsay & Blakiston, 1858, page 191.

A System of Dental Surgery, by John Tomes, F.R.S. Philadelphia, Lindsay & Blakiston, 1859, pages 197 and 280.

† The Pathology of the Teeth, by Carl Wedl, M.D., Professor of Histology in the University of Vienna. Translated from the German by W. E. Boardman, M.D., with Notes by T. B. Hitchcock, M.D., D.M.D. Philadelphia, Lindsay & Blakiston, 1872, p. 180.

ever, patients are unable to recall any such occurrences;" and he regards "deficiency of space at the time when the crown is formed as the cause of the phenomenon, while during the subsequent expansion of the contracted space the root would be enabled to develop in its normal position." In examining a series of jaws prepared so as to show the deciduous set with the crowns of the permanent teeth in situ, and noticing the crowded and peculiar position of the latter, it is not at all surprising that the permanent teeth frequently on erupting assume irregular positions in the arch. Indeed, it is rather a matter of astonishment that they ever come in and form a regular and symmetrical arch. While recognizing this, and also the possibility that under some circumstances the abnormal position of a flexed tooth may be induced by the cause assigned by Prof. Wedl, his explanation does not seem to the writer to be as plausible or satisfactory as that offered by Mr. Tomes. The history of the case under consideration indicates that the position of the crown during the formative period was changed by mechanical violence, and it does not necessarily follow that patients who are unable to recall any such occurrences may not have had similar experiences which have escaped their memory.

A case, apparently in illustration of this, came under my direct

FIG. C.



notice several years ago. I was seated in a room, where a child four years of age was playing about, who fell and struck the right superior maxilla with considerable force against the edge of a table, cutting

through the gum and the outer plate of the alveolus. Sixteen years have elapsed since the accident, and the right superior canine has failed to make its appearance. A very decided protuberance, however, exists on the inner margin of the alveolar process, opposite the place the tooth should have occupied, and it is reasonable to infer that this prominence is due to the presence of the crown of the unerupted canine, whose position was forcibly changed at the time of the accident. The citation of this case may prove of service in aiding others in forming a diagnosis of similar conditions.

Through the kindness of Dr. Geo. S. Allan, of New York, who some months ago placed in my hands several valuable sections of teeth prepared by him, I have had an opportunity of observing the microscopical appearance of a tooth in which flexion of the crown had occurred. One of the specimens is a longitudinal section of such a tooth, an incisor; and, as will be seen in the accompanying illustration (Fig. C), there is a marked derangement in the course of the dentinal tubuli. At the neck of the tooth where the bending occurs the tubuli present a crimped or crenated appearance, as if they had been thrown into this condition at the time of the accident, and then became permanently fixed by the addition of the calcareous constituents. A number of interglobular spaces will be observed in the immediate vicinity of the enamel, indicating the imperfect character of the dentinal structure. ●

RUIN! RESTORATION!!

BY MARSHALL H. WEBB, D.D.S., LANCASTER, PA.

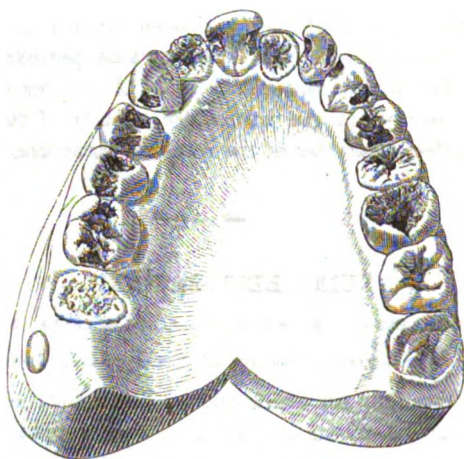
(Read before the Odontographic Society of Pennsylvania, December 8d, 1878.)

RUIN awaits not only all which mortal hand hath wrought, but nature's work is also tending unceasingly toward disintegration. The periods of formation, development, and solidification are quickly followed by destructive processes which, sooner or later, resolve into its native dust every animal or vegetable tissue; yea, the solid marble and the enduring granite. Though the result is certain, yet we still recognize in every manifestation of retrograde metamorphosis a trumpet-call to renewed effort in the prevention, palliation, and cure of mortal ill, or the restoration to comeliness, utility, and comfort of diseased and crippled organs. The lapidist exhausts his skill in fashioning, by cunning workmanship, the inanimate gem into a specimen of beauty; and why should not we be ambitious to excel in the nobler work of our specialty,—the salvation, not the substitution, of those gems which art cannot equal?

In the mouths of mankind we find destructive processes breaking

down the enamel prisms, exposing the dentine with its tubuli, and making known to pulp-tissue that devitalization threatens. Tooth after tooth is thus attacked; the work of disintegration goes on; part by part of the enamel wall is fractured and its contour broken up; the insidious advance has reached the pulp—perhaps caused its death; the crown is gone, and the thin brittle edges of the deep pulp-cavity scarcely rise above the surrounding tissues, reminding one of the crumbling walls of a ruined castle. This destruction of tissue progresses often unnoticed, save when odontalgia signalizes the approach to highly-organized parts or until the loss of a coronal part of one or more of the incisors or cuspids causes disfiguration, when the case presents not only with loss of structure but perchance with further complication of disease. All this may occur in the mouths of those who have not been negligent of their teeth, but unfortunately have submitted them to incompetent practitioners.

Such was the history of the case here illustrated.



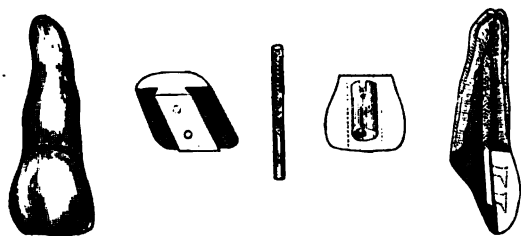
One could scarcely conceive of a denture more nearly ruined; for besides exposure of the pulp, and abscess connected with several of the teeth, a central and lateral incisor and a bicuspid and molar had lost their crowns, and caries had advanced to a great extent throughout the whole dental arch.

A little familiarity in the use of the forceps, a disregard of conscience, a few moments of pain to the patient, and a lasting injury would have been inflicted and the operator have proven himself unworthy of confidence. A pair of forceps and an artificial denture, however, have long since ceased to be the insignia of our calling. All honorable practice is founded upon a scientific basis.

In the treatment necessary to restore this nearly ruined denture but

few remedies were required, the removal of the causes of pathological condition being almost alone sufficient. When the parts had been restored to the normal condition, the smaller cavities of decay were filled as in all ordinary cases. After the application of the rubber dam, the yet moist fibrous-like portions of carious dentine were removed that a more perfect dryness might be had, so that further excavations could be made, or the burr be used, without so much pain as would have been inflicted by direct pressure upon a mass of decayed substance, causing oscillation of fluid through the dentinal tubuli and affecting the pulp.

In those cases where disintegration of dentine almost or fully reached pulp-tissue, a portion was allowed to remain; and after having used the warm-air syringe (this caused some little pain because of the evaporation thus induced), the discolored capping of dentine was saturated with pure wood creasote. Besides other qualities which this therapeutic agent possesses, it will destroy the *Leptothrix buccalis*, which it is thought has some influence in the causation of caries.

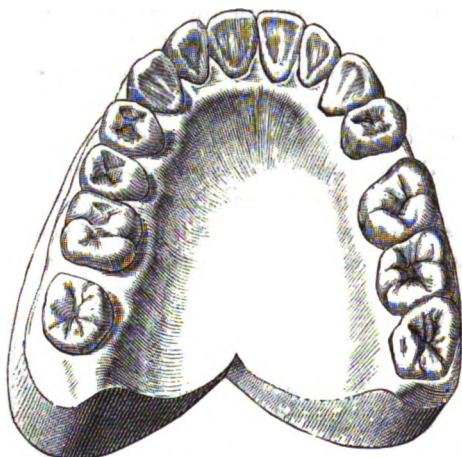


A gold crown with a porcelain face, as shown in the cut,* was built upon the central and lateral incisor roots; those of the molar and that of the second bicuspid were extracted. Since the operation the *dentes sapientiæ* have fully erupted, and have caused some closure of the spaces left by the loss of the molar and second bicuspid.

But few fillings of an ordinary character were required in this case, the cavities being generally of a complicated nature. Where an artificial capping of the pulp was indicated, Hill's stopping was made use of, except where the pressure necessary to adapt it would impinge upon the exposed part, when cement plombe was resorted to. Compound fillings were, therefore, necessary, and after carefully preparing the cavities these were inserted so that the contour of each tooth was restored; yet the teeth are not so closely in contact but that floss silk may be readily passed between them. To secure firm edges against which to pack the gold in filling several of these cavities, it was necessary to cut away a portion of the outstanding margins, and also to remove the remaining plate of enamel on the proximal surface to the neck of

* This operation was described in detail in the DENTAL COSMOS, June, 1873.

the tooth. Therefore,—the contour restored, protecting the edges of enamel and cementum,—should the teeth approximate, they will do so at the prominent portion of the gold fillings. Caries attacks the proximal surfaces of teeth, almost always, *at the point of contact*; and when the dentine is reached, the disintegration takes place along underneath the enamel toward the cementum, as well as in other directions. This being checked by the substitution of gold for lost tooth-structure, the teeth may be considered safe.



The whole operation was made as complete as possible, that the *ruin* might be fully *restored* for years of usefulness, perhaps until a want of dental nutrition in age causes absorption of the alveolar processes and the consequent loosening and loss of the teeth.

PROCEEDINGS OF DENTAL SOCIETIES.

SUSQUEHANNA DENTAL ASSOCIATION.

THE twentieth semi-annual meeting of this association was held in Williamsport, November 12th and 13th, 1873. Vice-President Dr. Missimer presided.

Dr. Welchens read an essay on "Dental Nutrition," advocating the necessity of attending to the requirements of nature during foetal life, by supplying the proper constituents as food, in order to produce good teeth. Did not believe the structure of the teeth could be improved after they are once formed by using any of the bone-making materials, unless it comes through the protoplasm of the plant, and then it required sufficient vital force and nervous energy to make them effective as dental nutrients.

Dr. Webb followed with an essay on "Dental Qualifications." Two points were especially brought out, viz.: That persons should not enter the profession unless they have a natural adaptation for the calling; and, having adopted it, should endeavor to advance themselves and the profession by being studious readers of dental literature and attending dental associations.

Dr. Missimer next read an essay on "Conservative Dentistry," recommending a greater effort to save the natural teeth.

Dr. Beck followed with remarks on gold for filling, and the manner in which it should be manipulated by the dental practitioner in order to produce the best results.

Dr. Newell read an essay,—subject, "Will the Coming Man possess a Dental Organization?" advancing some new ideas on this subject.

Dr. Webb conducted an interesting and instructive clinic. The following subjects were discussed at length, viz., "Cause of Discoloration of Gold Fillings;" "How to Cure Incipient Abscess;" "Best Gold for Filling," and "Best Mode of Treating Exposed or Nearly Exposed Pulp."

This meeting was one of the best that has been held since the organization of the society.

Adjourned to meet in Milton, May 13th, 1874.

G. W. KLUMP, *Recording Secretary.*

THE ASSOCIATION OF THE ALUMNI OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE Fourth Annual Meeting of this Association will convene at the College Building on Friday, Feb. 27th, at 10 o'clock, and will be continued during the following day.

The annual address will be delivered by the President, Dr. C. A. Marvin, of Brooklyn, N. Y., and essays upon subjects of interest, by prominent members of the profession, will be read and discussed.

Reports will be presented by Committees on Operative Dentistry, Mechanical Dentistry, Physiology, Materia Medica and Therapeutics, Chemistry, Dental Education, and other matters of importance.

Members of the association will be advised more in detail, and also notified of the *reunion*, by circular.

The Eighteenth Annual Commencement of the College will be held at the Academy of Music on the evening of *Saturday*, March 28th.

JOSEPH PETTIT, *Secretary.*

PHILADELPHIA DENTAL COLLEGE.

THE Eleventh Annual Commencement of the Philadelphia Dental College will be held at the Academy of Music, on Friday evening, February 27th, 1874, at 8 o'clock.

Address to the graduates by Harrison Allen, M.D., Professor of Anatomy. Valedictory by G. W. Stoddard, A.M., of Maine.

The members of the dental profession are invited to be present.

J. H. McQUILLEN,
Dean of the Faculty.

EDITORIAL.

NEW DENTAL JOURNALS.

THE new year adds two more journals, both monthly, to the list devoted to dental literature:

THE PENNSYLVANIA JOURNAL OF DENTAL SCIENCE, 40 pages, \$2.00 per year. Samuel Welchens, D.D.S., Publisher and Editor, Lancaster, Penna.

JOHNSTON'S DENTAL MISCELLANY, 40 pages, \$2.50 per year. Johnston Brothers, Publishers, New York.

The editor of the *Journal* in his salutatory says,—

"The conception of a journal as a kind of organ for the dental societies of the State arose in the regret that so much valuable scientific matter as is presented at the meetings of these associations, in the form of essays and discussions upon them, should be lost to the profession in general for want of a medium of publication. . . . These proceedings and this mass of valuable matter have been lost heretofore, in a general way, for the want of an organ through which they might be made to reach the profession at large. . . . We propose then to devote some twenty to twenty-five pages of each issue of the *Pennsylvania Journal* to the interests of these societies."

The publishers of the *Miscellany*, in their prospectus, say,—

"As the 1st of January, 1874, approaches, and it seems probable that unless this responsibility is assumed by us, our city, and indeed our section of country will, for another year, remain unrepresented in the literature of the dental profession, we have consented to enter upon the task."

We cannot quite understand the previous "want of a medium of publication," nor the necessity which any section of the country was under to remain "unrepresented in the literature of the profession." The trouble has not been the want of a medium of publication, but the want of original matter worthy of publication. We do not doubt that the experience of every one connected with dental journalism coincides with

our own; and the observation of a quarter of a century justifies us in saying that it is only with difficulty that original articles of merit can be procured sufficient to fill the pages of any dental journal.

As to the reports of societies, be the fault where it may, they have, as a rule, been most uninteresting reading. Instead of an abstract giving the salient points of essays, and the discussions which followed, the stereotyped formula of such reports is, "Dr. A. delivered a very able and instructive address upon Salivary Calculus, which was listened to with great pleasure by the members. A discussion followed, which was participated in by Drs. B., C., D., and E." We hope Dr. Welchens will succeed in procuring better reports of the proceedings of societies than the majority of those which have been heretofore furnished, and that his success may stimulate societies everywhere to see to it that the reports of their proceedings shall receive more intelligent preparation than they usually indicate.

We notice in the list of eminent gentlemen whose names are announced as pledged contributors to the *Miscellany*, several who have never yet contributed anything to dental literature, and are glad that they have felt moved to begin, and trust their example will be contagious. We sincerely hope that a new day has dawned upon the profession, in which all of the old journals, as well as the new ones, will be cheered by the receipt of abundant matter relevant to the specialty whose interests they are pledged to subserve.

Whoever or whatever contributes to the advancement of the profession in usefulness, self-respect, and public regard, has our most earnest good wishes.

Both journals are printed on good paper, with clear type, and present a very creditable appearance, excepting a "funny page" in the *Miscellany*, which we regret to see.

A QUERY AND ANSWER ANSWERED.

THE *Philadelphia Medical Times* of January 3d publishes the following query and answer:

"DR. F. R. THOMAS.

"NITROUS OXIDE GAS!"

"Only office in the city where the entire practice is devoted to extracting teeth absolutely without pain!"

"Colton Dental Rooms removed to 912 Walnut Street. Fresh gas made daily!"

"DR. F. R. THOMAS."

This glaring advertisement may be seen in any of the Market Street city street—
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cars, conspicuously placarded above one of the windows. If we have not been misinformed, the individual so prominently brought before the notice of the public by this means stands well with his fellow-dentists. Have all the members of the dental profession this liberty accorded them with their diplomas? Is dental surgery a department of the science of medicine, or is it a trade, a business, without a code of ethics?

We should be pleased to hear the status of the dental profession (for such it is termed) defined, in the present day of doubt and uncertainty. If such things be permitted, whither, indeed, is dentistry drifting?

Respectfully, yours,

DENS.

Answer.

Dentistry has been a business; at least we are not aware of the existence of any code of ethics. Whither it is drifting it is hard to say. The editor of the DENTAL COSMOS thinks it is drifting into a profession. *Quien sabe?*

As the editor of the *Times* is "not aware of the existence of any code of ethics," we take pleasure in informing him that there are at least two codes in existence: one, that of the American Medical Association, to which he is responsible, but the *spirit* of which he seems not to have imbibed; the other, governing the American Dental Association and the State and local societies under its jurisdiction.

The national, the State, and the two local associations in Philadelphia (The Pennsylvania Association of Dental Surgeons, and the Odontographic Society of Pennsylvania) declare it "unprofessional to resort to public advertisements, cards, handbills, posters, or signs, calling attention to peculiar styles of work, lowness of prices, special modes of operating," etc.

The gentleman to whose business card attention is called by the querist of the *Times* is not a dentist, does not call himself a dentist; on the contrary, declares in the card which the querist quotes that his "entire practice is devoted to extracting teeth,"—this being *the fact* which he appears most anxious to impress upon the public.* The unknown querist may be excused on the supposition that he is a foreigner and does not know what dentistry means; but why did not the editor of the *Times* inform him that the extraction of teeth does not constitute the practice of dentistry—is in fact, nowadays, an infrequent incident of practice? Why could he not remind him that the dental profession are not to be held responsible for the course pursued in the instance referred to, any more than the medical profession are to be held responsible for the acts of many so-called doctors?

Whether F. R. Thomas is or is not a graduate of a dental college does not enter into the question. Diplomas, either in dentistry or medi-

* See his reply which we copy from the *Times* into our department of "Hints and Queries."

cine, are unfortunately not guaranties of "regular practice." Whether a "practice devoted to extracting teeth" is or is not a legitimate business does not enter into the question. The function of dentistry is not to extract teeth, but to save them, and he who advertises a practice devoted to their extraction holds the same relation to dentistry that the surgeon would hold to his profession who should advertise his practice as devoted to amputating limbs.

If "standing well with his fellow-dentists" means association with them in professional organizations, it is only proper to say that Dr. Thomas is not and cannot become a member of either of the local, of the State, or of the national associations. He neither practices nor professes to practice dentistry, and is a dentist precisely as a bleeder, a copper, or a leecher, is a doctor.

The "bits" at the dental profession by the editor of the *Times* remind us of the Irishman's account of a fight: "The first time he bit him he missed him, and the second time he bit him in the same place."

OBITUARY.

W. S. SHIELDS, D.D.S.

DIED, at San Bernardino, California, December 1st, 1873, Dr. W. S. Shields, of consumption.

He studied dentistry, and practiced for several years in the mountains of California, and subsequently graduated at the Philadelphia Dental College in the class of 1869-70. He was a good operator, and served his patrons conscientiously and earnestly.

F. M. SHIELDS.

PERISCOPE.

TRANSPARENT HYPERTROPHY OF THE GUMS.—Mr. Bell has furnished me with the following notes:

"The most remarkable case of this form of gum-hypertrophy which ever occurred in my practice was that of a young woman, aged twenty-two, who was under my care at Guy's Hospital for a considerable period.

"The whole of the gum in both jaws was greatly thickened, and had a semi-transparent appearance of a pale pink color. The substance of the enlarged gum was very firm, and about a quarter of an inch thick at the edge; in extent it was abruptly limited to the gum itself, the integument beyond this limit not having any unusual structure. No pain was produced by cutting the growth, and so slight was the supply

of blood that scarcely any flowed from the incision or upon extracting a tooth.

"The alveolar process gradually became absorbed, and every tooth, one after another, was lost. During this period there was not the slightest inflammation, nor did she suffer any pain; in fact, the looseness of the teeth produced no other trouble than the mere mechanical loss of power.

"As the teeth came out, or were extracted, the gums very slowly healed. Some months after the last was removed she was able to wear an entire set of teeth.

"During the whole period she was in tolerable health, with the exception of continued amenorrhœa.

"I should add that in the early treatment of the case I employed free scarification and strong astringent lotions, but they produced no effect. I kept the patient in the hospital for a very long time for the purpose of watching the whole progress and termination of the case.

"I have seen this same condition in a less degree in a few instances. In each the patient was a woman, and suffering (I believe also in each) from amenorrhœa."

The case which I attended had been under Mr. Bell's care before I saw her. The malady was precisely the same as he describes, but it affected the teeth in succession.

Miss S——, a maiden lady about sixty years of age, of very unhealthy appearance, applied to me at Christmas, 1861, to have a tooth extracted. Upon inspecting her mouth I found that only four teeth remained; all the others, she told me, had been extracted by Mr. Bell under the same circumstances as the bicuspid she now wished removed. This tooth was loose and slightly painful, and around it was hypertrophied gum which looked like a ring of clear, pale, pink glass, sharply defined, and about the thickness of a goose-quill. She informed me that for many years—more than twenty—she had been afflicted with this disease of the gums, attacking in succession the neighborhood of one or more teeth in an indiscriminate manner at different parts of the mouth. When once the gum became thus affected the contiguous tooth was doomed. It was only a matter of time; the hypertrophy increased, the tooth first loosened and then became painful, and its extraction was soon necessary.

I noticed that the gum around another tooth had already commenced to exhibit the same change; and about a year afterwards I extracted this tooth also. Though so long a period had elapsed, the clear tissue around the last-removed tooth had not all disappeared.

Since then I have extracted the last two teeth under precisely similar circumstances; the last of all was the left lower wisdom tooth. Being very ill and nervous, Miss S—— postponed the operation till the tooth was nearly buried in the glassy mass.

In this patient, as described before, the growth was insensitive and nearly bloodless.

In extracting the second tooth a small portion of the gum came away with it. I found that the epithelial covering was very thin, and the papillæ were short and seemed expanded; so that instead of being like the fingers of a glove they looked like a series of half-circles.

One of the most remarkable points in this malady is the stagnation which follows the extraction of the teeth. Instead of the wound

closing and the gum becoming healthy and healing, it goes on for months with the least apparent change.

What the etiology of this condition may be I cannot suggest. It is altogether different from anything else I have ever seen.—*S. James A. Salter, M.B., F.R.S., in British Journal of Dental Science.*

OCULO DENTAL AFFECTIONS.—It is probable that a certain number of ocular affections arise from diseases of teeth, or from disturbances in their evolution; it is these affections that the author proposes to call oculo-dental affections. Unfortunately, the clinical facts upon which we can depend to describe these lesions are at present restricted, and they are not sufficient to demonstrate anatomically the connection which may exist between the dental nerves and the ophthalmic branch. to prove the existence of oculo-dental affections. As M. Galezowski remarks, all painful affections of the eye carry in their suite neuralgic pains, radiating in the dental branches of the nerves of the upper or lower maxillæ. This is a fact well known, not only to specialists, but to well-informed practitioners. But what are less known are the ocular lesions following dentition, dental caries, or operations on the teeth such as plugging, cauterization, or the introduction of artificial teeth. There is certainly here a chapter of pathology generally ignored, which merits the attention of surgeons.

M. Galezowski only deals with, or at least only appears to wish to deal with, ocular lesions following dentition or dental caries. According to him, the kerato-conjunctivital phlyctenulæ so frequent in strumous children is merely the result of dentition; whence their appearance between the sixth and tenth year. In young children, abscess of the cornea can arise from imperfect or difficult dental evolution, and interstitial keratitis occurring at the time of the second dentition is a frequent result of it. Besides keratitis, kerato-conjunctivitis may also be developed later, on the appearance of the wisdom teeth.

Here the work of M. Galezowski finishes; a work to be continued later—the author does not say where.—*Monthly Review of Dental Surgery.*

REPLANTATION OF TEETH.—Replantation of teeth as a useful remedy in dental surgery has never been received with much favor by the dental profession. The results of cases prove, however, that at least there are conditions in which it is of great value.

The art and science of dental surgery has not yet arrived at such a high state of perfection that we have a remedy for every disease to which teeth are liable, unless we consider extraction as one, a remedy too often used unfortunately.

The principal affections for which extraction is practiced are necrosis, acute inflammation of the pulp, acute and chronic periodontitis, exostosis, and caries. Of these, necrosis and exostosis are the only diseases for which extraction is almost unavoidable; for the rest, a tooth affected with any one of them may, in the great majority of cases, be saved by appropriate treatment. But in ordinary practice, extraction is the usual remedy adopted. Unfortunately, it is generally the wish of the patient, who, perhaps, having already suffered so much pain, prefers the speediest remedy. On referring to the various works on dental surgery, we find that remedies for different diseases of the teeth are so few in number that he who adds one remedy renders a service to humanity.

Such an one is replantation of teeth for acute and chronic periodontitis. This was suggested by Mr. Coleman, after seeing the same remedy succeed for acute inflammation of the pulp of a lower molar tooth, which had resisted every other known kind of treatment.

The principal objection urged against replantation of teeth is, that if a tooth is extracted it must necessarily lose its vitality, and therefore the fangs undergo absorption, so that after a time it becomes useless and must be extracted. Supposing the objection to be valid, as absorption is a long process, sometimes extending over years, it will have been a greater gain for a patient to retain his tooth for an indefinite period than to lose it entirely and at once; but it is no more necessary that a tooth after undergoing extraction and replantation should lose its vitality than for a long bone to do so after fracture, with stripping back of the periosteum. The extraction of a tooth may be divided into two parts,—firstly, the laceration of the alveolo-dental membrane or periosteum; secondly, that of the nerve and blood-vessels supplying the tooth. As regards the former, there is no reason why the alveolo-periosteum should not again unite to the tooth, seeing that if a piece of periosteum be stripped off a bone it will unite again if placed in contact with the bone and left at rest. The union of the divided ends of a nerve is also a recognized fact; but even supposing this latter impossible, the tooth would merely be in the condition of one which has had its pulp destroyed—a common operation in dental surgery.

The manner of performing the operation is as follows: A tooth which is to be replanted should be carefully extracted, and as little as possible of the surrounding tissues lacerated; it should then, unless the operation be simply for the destruction of the dental pulp, and where the periosteum is healthy, be immersed in some antiseptic fluid, such as diluted carbolic acid or chloride of zinc (the latter from experience being preferred); the socket should then be swabbed out some half-dozen times with a strong solution of the same antiseptic employed. The tooth, if carious, should be plugged and returned to its place. If there is any thickening of periosteum, fibrous growth, sac of abscess, or absorption at the extremity of fang, it should be excised before replantation. Should patient complain of pain arising from the operation, prescribe poppy fomentations, although the pain is rarely more than what is due to the tenderness of parts from the laceration of soft tissues after the extraction of the tooth.

Out of twelve cases that I have operated on within the last four years, nine are successful and three have failed. The failures have but one significance, and that is, teeth to undergo replantation must be selected. In a cachectic patient the chances are against success; when a tooth has lost the support of its fellows on both sides, it cannot become firm. Nevertheless, the successful cases warrant a further trial of replantation, which would preserve many teeth otherwise sacrificed. The number of my cases during the last four years were twenty-seven, some of which cannot be traced; the remainder are too recent to be judged. The reason why they are so few arises from the difficulty of inducing patients to believe in such a remedy as replantation.—*Isidor I. Lyons, M.R.C.S., L.D.S., in The Lancet.*

ANELECTROTONUS OF THE DENTAL NERVES IN TOOTHACHE.—Now that, thanks to the activity of instrument-makers in meeting the increased professional demand for constant batteries, fairly effective

instruments of this kind are becoming household goods of the medical man, and are within reach of even slender purses, I wish to suggest a routine recourse to the constant current for that very common affliction of mankind—toothache. I have never been consulted with the view of treating toothache by electricity, but have for many years past incidentally used the continuous current in a large number of such cases, and come to the conclusion that it is a ready and most effective means for the cure of odontalgia. Without wishing to enter here into the pathology of this "small misery," I may say that the mere decay of teeth appears, as a rule, only indirectly productive of toothache, which, indeed, is very frequently experienced in teeth that are perfectly healthy, and in decayed teeth not always, but only under certain contingencies. Chills and depressing emotions would seem to be the chief exciting-causes of toothache. Now, the terminations of the dental nerves are more exposed to chills in decayed than in healthy teeth; and, under depressing emotional influences, the weak points of the system are chiefly apt to suffer. These considerations would explain why toothache is more frequently felt in bad than in good teeth.

What is the best mode of galvanization for toothache? After numerous trials of various modes, I have come to the conclusion that the induction of anelectrotonus of the dental nerves, with complete avoidance of catelectrotonus in their neighborhood, answers best. Pfüger has shown that a continuous current, which traverses a certain length of the nerve, divides this latter into two physiologically different sections or zones, one of which shows the condition of increased excitability or catelectrotonus, while the other is in a condition of diminished excitability or anelectrotonus. The zone of increased excitability is in the neighborhood of the cathode, while the zone of diminished excitability is in the neighborhood of the anode. The condition of increased excitability is propagated from the cathode towards either side, and the condition of diminished excitability is propagated from the anode towards either side. This alteration of excitability in the extra-polar portions of the nerve diminishes in the same ratio as the distance at which they are from the electrodes increases, and at a certain distance it disappears altogether. Cyon has shown that Pfüger's researches, which were made on rheoscopic frogs' limbs, hold good for the nerves of the living man likewise; and the systematic production of catelectrotonus and anelectrotonus, for the purpose of increasing or diminishing the excitability of diseased portions of the nervous system, has thus been shown to be a therapeutical possibility.

These principles may be utilized in the case now under consideration by placing the large anode, armed with a moistened sponge, to the suffering cheek and jaw, and the cathode to the palm or the back of the hand. In this way, both the second and third branches of the fifth cerebral nerve are placed into the condition of anelectrotonus, while the influence of the cathode is neutralized by its great distance from the suffering parts. One application of a gentle, but plainly perceptible, current continued for five minutes is sufficient for curing almost every toothache; but, in very bad cases, a second application may be required for effecting the desired result. This may be had the same day, if practicable.

The same principles apply to the galvanic treatment of the different forms of neuralgia, which yield readily to the induction of anelectro-

tonus, if practiced sufficiently early. In the later stages of neuralgia the phenomena are not so simple as in the commencement of it, and the treatment then becomes more complicated and less readily successful.—*Julius Althaus, M.D., in British Medical Journal.*

A NEW OPERATION FOR CLEFT PALATE.—On Saturday, the 22d inst., Sir William Fergusson, in operating on two patients for the closure of the opening in the hard palate after the cleft in the soft palate had been closed, adopted a modification of a procedure which is intended to increase the chances of success of the operation. Sir William remarked that in the so-called Langenbeck operation—that is, where muco-periosteal flaps are taken from the roof of the mouth and drawn towards the middle line—the proceeding is often unsuccessful from the fact that, after some time, the granulations which are thrown out on the upper surfaces of the displaced flaps contract and separate the union that may have taken place between the pared edges of the flaps. It is true, he observed, that some assert that bony matter is deposited on the upper surface, and that this diminishes the size of the aperture in the osseous palate. But, in demurring to this, Sir William said he thought it was hardly possible to strip off healthy periosteum from the subjacent bone. He proposed, therefore, as a remedy, that in addition to making the ordinary incisions for the flaps, the hard palate should be split on each side of the opening with some sharp cutting instrument, and that the two pieces of bone should be pressed towards the middle line, and the pared edges of the soft tissues then be brought together. By this means the central opening would be closed, but two lateral apertures would be formed. But inasmuch as the lateral openings would be but half the size of the original central one, and as there would be more likelihood of the fractured edges of bone throwing out osseous material for its repair, it was hoped that the prospect of a successful issue would be greatly enhanced.

It remains to be seen what will be the result of this ingenious device, but on the first blush it appears that by its adoption a means is offered of surmounting one of the most obstinate difficulties of plastic surgery.—*The Lancet.*

HEREDITARY TRANSMISSION OF STRUCTURAL PECULIARITIES.—Dr. Shorthouse has kindly given me the following memoranda, which are highly interesting in connection with the subject of breeding and transmission of peculiarities. He says he first received the hint on the subject from Mr. South. He observes that men with cleft palates do not beget children; they copulate in all ways like other men, but do not procreate. It is a fact for which there is no explanation. He remarks: "We are all acquainted with the relationship which the tonsils and glands at the posterior part of the palate have with the organs of generation; also of the fact that the excision of the tonsil causes the absorption of the testes. Periostitis also is very frequently the cause of the wasting of the left testis. Of this circumstance I have seen at least thirty cases. It is probably because the tonsils and other glands at the posterior part of the mouth are either defective or interfered with. The non-secundity does not extend to the weaker sex, as women with cleft palate breed as well as their more developed sisters. It is also a fact that cleft palate is about seven times as frequent in females as in men." He goes on to say next, "The young

lions (or lion cubs) which are whelped at the London Zoological Society's Garden are all of them born with cleft palate, and ALL OF THEM DIE. I do not mean those which are the issue of *one* particular lion or lioness, but of all the pairs of lions and lionesses at the gardens. It seems a sort of indigenous deformity. But, as a matter of fact, the managers cannot rear any young lions; they all of them die, and all of them have cleft palates.* Now, in traveling menageries, and also at the Dublin Zoological Gardens, the lions and lionesses rear up cubs to maturity, and none, or at any rate very few, if any, have cleft palates. But, at any rate, they live and are reared, whilst those born at the London Zoological Gardens all die in infancy. Is this difference, I would ask, solely attributable to climate?—*British and Foreign Medico-Chirurgical Review*.

LARGE GRANULAR TUMOR OF THE PAROTID.—Mr. Wagstaff exhibited a specimen of the above, weighing sixteen ounces, which had been removed from a man, aged fifty. It had been growing for fifteen years, but had rapidly increased of late. It was first a small nodule near the *facia parottidis*. On admission, it was the size of two fists projecting from the cheek, attached firmly, superiorly projecting backwards and upwards, causing pain by pressure on the nerves. On section, it was found to be honey-combed with cysts; these latter being partly due to the development of true cysts, and partly to degeneration. Microscopically, was seen a framework of connective-tissue, the cells undergoing cretification; there was no evidence of bony or cartilaginous growth.—*Reports Pathological Society of London*.

CASE OF PURULENT INFECTION AFTER EXTRACTION OF A TOOTH.—The case was that of a man of strong constitution, who had recourse to a horse-farrier for the extraction of one of the last left molars. The gums were violently contused, and a fragment of the alveo-dental periosteum torn away. A few days after, the following symptoms occurred: headache, insomnia, fever, horrible fetor of breath, inflammation of the left cheek and gums, with formation of an abscess. Notwithstanding energetic treatment, the patient died two or three days later. The author draws attention to the importance of not wounding the gum in extraction of teeth. Recorded by Dr. Bouyon in *Courrier Médical*.—*The Lancet*.

CLINICAL NOTES.—The following brief account of some rather rare cases may prove interesting, and elicit further communications of a similar nature, as a record of such is valuable, more perhaps as being curious than practical.

Supernumerary Teeth.—The patient, a young lady of about sixteen years, with strong, well-developed teeth in perfectly regular arrangement, had three small supernumerary teeth growing from the palatal surface of the superior maxilla, near to the canine and bicuspid of the left side.

The most unusual feature of this case was the exceeding minuteness of these three teeth, the largest being about the size of a grain of

* This statement is, I find, not strictly accurate. My friend, Mr. Slater, the Secretary of the London Zoological Society, informs me that though in several instances the lions born in the gardens have had cleft palates, it is not always so. He is unable to give any explanation of the fact.

wheat, and the smallest, of a mustard seed ; they were perfect in shape, being conical, with enamel on the crown, and each implanted by means of a tiny cementum-covered fang. They were removed on account of the roughness felt by the tongue, and they had a somewhat firm implantation.

Supplemental Teeth.—A hospital patient aged between three and four years came to the out-patients' room at University Hospital, with the following curious abnormality. There were evident signs of four superior temporary *central* incisors, for three were in place in regular order, but much decayed on each side, the fourth had only the root remaining, which was also in the dental arch, and was distinctly separated from its neighbor.

I have sought unsuccessfully for an account of an exactly similar case, though it says in Tomes' "Dental Surgery" that variations as to number, more or less, are not very uncommon in the temporary set ; it would be interesting to notice if a similar vagary happens in the permanent set.

Absorption of the second molar by the advance of the wisdom, or rather during its advance I lately had the opportunity of seeing this remarkable pathological case in a lady advanced in life, certainly more than forty, who had never had the left superior wisdom tooth. However, she came complaining of the looseness of the second molar ; and as it really only seemed to be attached to the gum, Mr. Tomes removed it, and, to our surprise, we found the wisdom tooth lying completely under the place where the other had been, apparently just on the point of eruption. On examining the second molar it was found to have been nearly entirely absorbed, except the crown, part of one root only remaining ; its under surface was hollowed out into pits and grooves just like a temporary tooth would be ; when partially absorbed there was a vascular mass, lying partly over the crown of the wisdom tooth, by which no doubt absorption had been effected.—*S. J. Hutchinson, L.D.S.R.C.S., in British Journal of Dental Science.*

PHOSPHORUS IN NEURALGIA.—In October of last year I wrote a letter to the *British Medical Journal*, calling attention to the value of phosphorus in the treatment of neuralgia. Since this date I have given it a somewhat extensive trial, the general result of which is to confirm the favorable report I made of it in my first letter. I have prescribed it in various neuroses, in melancholia, in impotence, in mercurial tremor, in locomotor ataxy, etc., but have come to the conclusion that its value is most conspicuously and constantly seen in cases of nerve-pain, accompanied or caused by asthenia : indeed, while it has appeared to me quite inert in most of the separate diseases I have mentioned above, it has rarely disappointed me, when properly administered, in true cases of anæmic or asthenic neuralgia, among the remedies for which disorders I believe it will ever hold a high and secure place. Its mode of administration is, however, of importance ; and while in many respects agreeing with Mr. J. Ashburton Thompson in his remarks upon this remedy which appear in the *Practitioner* for July, I cannot indorse his statement as to the wisdom, or even the safety, of beginning with a dose of one-twelfth of a grain every four hours. M. Gubler, in a recent number of the *Bulletin Général de Thérapeutique*, is more correct, I think, in urging great caution in the administration of this powerful remedy : indeed, in the seventeen cases treated by Mr.

Thompson, one suffered from serious and alarming symptoms, as the result, we may fairly presume, of the phosphorus, which was administered in the dose of one-twelfth of a grain. My custom is to commence with one-hundredth of a grain, and gradually increase this by one-fiftieth of a grain at a time, until, if necessary, one-tenth of a grain is taken with each dose. Beyond this quantity I do not go; as I think that, if the remedy be of use, relief will be attained by this dose equally with a larger. After trying several preparations, I now use a formula which Mr. Potts, dispenser to the Manchester Royal Infirmary, hit upon, and which seems to answer every purpose, in being tasteless, transparent, and readily prepared. He dissolves ten grains of phosphorus in two ounces of ether, agitating the solution from time to time; and of this solution, one minim (containing one-hundredth of a grain) is administered in an ounce of water with half a drachm of glycerin. The glycerin suspends the phosphorus so perfectly that a transparent mixture is the result. The addition of a little bitter infusion entirely removes any *soupcçon* of lucifer-matches which may hover about the medicine.—*S. M. Bradley, in British Medical Journal.*

ELECTRICITY IN NEURALGIC AFFECTIONS.—While all the best authorities on the use of the constant current agree in estimating very highly its remedial power in neuralgic affections, they vary in their experience of its value in the different forms of this disease. . . . In all the true neuralgiæ, then, the diagnosis having once been clearly made, the constant current is the form of electricity to use; and used rightly, so as to act gently and steadily, without exciting pain or other nervous disturbance, it may be employed fearlessly and with immense advantage.

This kind of electricity has also been successfully employed in toothache. M. Bouchaud states (*vide Bulletin Général de Thérapeutique*, July 15), "If in odontalgia we employ a continuous or constant current, derived from a mean of ten elements, applying the positive pole to the cheek on a level with the painful tooth, and the negative pole to the anterior lateral region of the neck, we are enabled almost always in the course of a few minutes to procure nearly absolute relief, which in the majority of cases persists indefinitely." M. Bouchaud's paper on the subject is well illustrated by cases; and he has found the constant current useful even when the teeth were carious and the gums inflamed and swollen.

If for any reason it is determined to apply the faradaic current in neuralgia—and sometimes it is beneficial—the rough, coarse current supplied by a rotatory magneto-electric machine should not be ventured on, but the most gentle and steady current of this kind derivable from a volta-faradaic apparatus. In some painful affections, however, faradisation may be employed, not only usefully, but with much greater advantage than the constant current. Such are the pseudo-neuralgiæ called "hysterical," and the hysterical hyperæsthesiæ. In these affections it is desirable or necessary to excite pain, and the ordinary rotatory machines will serve for the purpose. The current must be used to affect the skin only, not to penetrate deeper; the skin must therefore be carefully dried, and dry metal electrodes used—one being placed on an "indifferent spot," and the other moved about over the affected part; or, the patient holding one of the brass handles of the machine, a coarse wire brush may be applied over the affected region.—*Medical Times and Gazette.*

ARTIFICIAL FEEDING OF CHILDREN.—Dr. Dunster, in his note, indicates an accurate line of practice in infant nutrition. He says: "The great vice of feeding infants after six or eight months, and young children, is the eternal *sameness* of their diet. Feed a dog or a child on cream or concentrated beef-essence exclusively, and they will inevitably starve to death; much more so, therefore, when fed on substances which they cannot easily digest, and which contain but relatively small amounts of nourishment. Infants do not secrete saliva until three months or more, therefore they cannot digest farinaceous foods before this time; and even after that age those only must be selected which retain the gluten or nitrogenized portions. Pure starches, like arrow-root, etc., have annually killed their hecatombs of infants, and both people and too many physicians, I am sorry to say, have not yet learned this sad fact, one of the simplest of all physiological truths. The inference from all this is plainly that the diet must be varied—oatmeal cooked to a jelly, the juice of rare beef (worth more than all the beef-tea or beef-essence that ever was made), crackers that are friable and do not contain alkalies, barley, or crust of bread, sometimes scraped fruit, either cooked or raw when ripe, occasionally a bone pretty well stripped of meat, butter, etc. All these must be gradually added to milk, which will of course form the staple of the diet for the first three years of life. I have tried many of the substitutes," he continues, "for mother's milk, and find almost all of them do well for a time; if continued and relied upon, there is not one of them but will disappoint you, and for the very reason I have stated in the above paragraph. They require as much skill—dietetic and culinary—for their management, as the getting up of a first-class dinner. The error is that they and they alone are relied on. They soon become distasteful, the stomach rejects them from pure disgust, and soon will not digest them. I have many times seen children with diarrhœa and vomiting, and consequent mal-nutrition, change at once by being put on other articles, but only in turn to fall into the same condition when too much reliance has been placed on them. The *quantity* of food to be given must depend on the condition of the child. The time of giving and the value of stated periods I have already endeavored to make plain, but they will be more fully shown in the annexed diet-list, which may be of service to those who need a ready guide.

DIET OF CHILDREN IN HEALTH.

DIET 1.—From birth to six months. If child be nursed, nurse's milk, and *no other food*.

Nurse every two hours for first six weeks; six weeks to four months, every three hours.

From four months till two, four, or six teeth are cut, every four hours, when additional food may be given.—See **DIET 8**.

During the whole time of nursing, never nurse later than 11 P.M. or before 5 A.M.

After the teeth appear, no nursing at night, but continuing through the day till weaning, gradually lengthening the intervals.

DIET 2.—For infants brought up by *hand*, three or four ounces of fresh unskimmed milk and lime-water, with one teaspoonful of sugar of milk or loaf-sugar, the mixture to be tepid.

For first six weeks, half lime-water, and every two hours.

From six weeks to four months, one-third lime-water, and every three hours.

From four months till two, four, or six teeth are cut, every four hours.

N.B.—If the infant can be only *partially* nursed, nurse twice a day, and for other meals follow Diet 2.

DIET 3.—From seventh or eighth month (when two, four, or six teeth are through) to one year, **FIVE MEALS.**

6 or 7 A.M.—A cup of *pure* milk (if digested), with two teaspoonfuls of farina, oatmeal, wheaten grits, rice or rizensa, barley flour. It is well to alternate rice with oatmeal or farina.

11 A.M.—Milk with bread-crumbs, milk crackers or rusk. Twice a week the yolk of one egg, beaten with teacup of milk, may be given with the bread and milk, etc., juice of raw beef, heated a little, or beef-tea, chicken or mutton broth, in small quantity. At about ten months, a piece of rare beef or chicken bone to suck.

2 P.M.—One cup of milk, with lime-water, if necessary.

5 P.M.—Same as at 7 A.M.

11 P.M.—*If needed*, same as at 2 P.M.

A healthy child, between ten and twelve months old, requires a pint and a half to one quart of milk in twenty-four hours.

DIET 4.—From one year to eighteen months.

7 A.M.—Same as Diet 3, at 7 A.M., or with a rusk, slice of bread, well soaked in milk.

11 A.M.—A drink of milk, slice of bread and butter, rusk or crackers.

1 P.M.—A cup of beef-tea or piece of rare beef, chicken or mutton broth, with bread, rusk, or milk crackers; a mealy potato, moistened with beef gravy, one or two tablespoonfuls of light pudding, rice, rizensa, corn starch, or sago, made with milk.

6 P.M.—Same as 7 A.M.

11 P.M.—A drink of milk, *if required*.

A healthy child, between one year and eighteen months, will take two or three pints of milk in twenty-four hours.

DIET 5.—From eighteen months to two years.

7 A.M.—Cup of milk, rusk, bread and butter; occasionally yolk of one egg.

11 A.M.—A cup of milk, or rice and milk, with ripe fruit occasionally.

1 P.M.—Rare beef, broths, soups not too rich, baked potatoes, with gravy, milk, or toast-water, or simply water as drink; small quantity of custard or other light pudding.

6 P.M.—Bread and butter, rice (or rizensa) and milk, occasionally stewed fruit.

Between two and three years, same diet may be continued, substituting 11 A.M. and 1 P.M. meals for one at 12 M. Meat can be given every day; vegetables, except cabbage, turnips, and parsnips; morning and evening, principally milk.

DIRECTIONS.

1. Do not feed between meals.

2. Cook the food **THOROUGHLY**.

3. **ALL FOOD SHOULD BE SALTED.**

4. If the food in the diet-list does not agree, notify your physician at once.

—*Dr. Jerome Walker, in the Sanitarian.*

INFANTILE CONVULSIONS.—There is no disease to which young children are subject which causes more anxiety to parents and medical men than convulsions arising from the irritation of teething. It is unnecessary for me to describe the symptoms, as they are only too well known to the profession.

What I wish to bring forward are the facts that no disease to which the flesh is heir has been treated and is, I fear, still treated in a more unscientific manner by a great many men, who, though they see the ill effects of the remedies employed, still, like the great Sangrado, put it down "to the smallness of the dose," and prescribe "more copious draughts," instead of allowing themselves to be taught by experience.

The first time I treated the disease was when, on my return from Edinburgh, with the ink scarcely dry on my diplomas, I was appointed *locum tenens* to a large and important dispensary district, where, strange

to say, I was called to see two cases of convulsions almost exactly similar as to age, symptoms, etc.

Before prescribing, I consulted the only works I possessed which treated of the subject. One advised calomel and warm bath; the other the warm bath and bromide of potassium. Being young and inexperienced, I thought I would try both plans and judge for myself which was the best. To one I gave the prescribed doses of calomel and the bath; to the other, which was slightly the worst case, the bromide. The result was such as to make me give up mercury in every shape and form as a remedy for infantile convulsions, and my experience since, both in public and private practice, has justified that decision. The child treated with calomel was purged freely; abdomen became tympanitic; tongue and lips covered with sordes; and died comatose within twenty-four hours. The other had perfectly recovered before that time.

Since then I have treated over fifty cases with the bromide of potassium, and have not lost one.

The treatment I usually adopt is to immerse the body in warm water as hot as the child's age will permit, leave it so for about two minutes, then take it out and wrap in a dry warm blanket, and give it (say at ten months' old) two grains of potass. bromidi every hour till relieved; then I usually order it a tablespoonful of lime-water in its milk every morning for a week or so.

When there is a tendency to convulsions (foul tongue and breath, screaming, restlessness, disordered secretions, etc.), I have found the addition of lime-water to the child's milk an invariable preventive.

Hyd. cum creta, the usual remedy (I believe), owes its doubtful reputation to the quantity of chalk it contains, which to a certain extent neutralizes the acid secretions of the stomach and intestines.

The administration of mercury for the relief of infantile disorders is to my mind not only unscientific and useless, but dangerous in the extreme, and is, I am afraid, the cause of a great many of the ailments of the present generation, who in their infancy were dosed *ad libitum* with it in its numerous preparations. One of the first objections to the mercurial treatment of disease that struck me was the apparent want of knowledge shown, in every medical work which advocated its employment, as to its *exact* influence on any known disease, and above all on those of infancy. The only influence I have found it to possess is to lower the patient and render the disease more intractable. If you consider the above worthy of insertion I shall feel obliged by your giving it a place in your journal.—*Wm. Donovan, L.R.C.P., L.R.C.S. Ed., etc., in Medical Press.*

DIARRHŒA IN TEETHING.—In a clinical lecture on the primary dentition of children, Dr. Francis Minot, in speaking of the diarrhœa complicating teething during hot weather, recommends the common chalk-mixture, with the addition of one-fourth part of tincture of kino, which increases its astringency, and also keeps it from turning sour in hot weather. If the diarrhœa be not stopped by this mixture, one drop of laudanum may be added to a dose, but not oftener than three times a day in children under two years old. Diarrhœa is most apt to attack children who are brought up on the bottle, hence, if the case be urgent, and does not yield to treatment, a wet-nurse should be procured, if possible. When this cannot be done, he would strongly recommend the method

of preparing the milk with arrow-root and gelatine, found in the treatise on *Diseases of Children*, by Drs. Meigs and Pepper. Brandy is very useful to a teething child exhausted by diarrhœa, which should be given once in three or four hours, or oftener in urgent cases. The dose is ordinarily from five to twenty-five drops, given in milk; but if there be much prostration the physician need not fear to increase the amount.
—*Boston Medical and Surgical Journal*.

TEETHING CHILDREN.—The treatment of diarrhœa in teething children is apt to be looked at from a one-sided point of view—the quickest way to arrest it. We have diarrhœa—1, from dental irritation; 2, from indigestion caused by over- and under-feeding; 3, from atmospheric changes. Then, too, the diarrhœa may be of a simple, inflammatory, choleraic, or dysenteric character; each variety demanding a different plan of treatment.

Astringents, as a rule, are to be condemned. The diarrhœa will continue in spite of them, unless other precautions are taken. If the motions contain mucus and are slimy, and there is a trace of blood and redness about the anus, chalk-mixture and kino will be of no service, nor will bismuth, acids, or oxide of zinc. The diet is primarily at fault in these cases, and undigested food has passed into the bowels. Warmth and complete rest, with a dose of castor oil in such cases, is the most appropriate treatment, though the gums may require puncturing, and a grain each of hydrargyrum cum creta and Dover's powder may be necessary. Occasionally a quarter-grain of calomel, with a grain of Dover's powder, will be found of great value. Among hospital patients a large number of cases of diarrhœa are attributable to over-suckling and suckling by mothers in delicate health. The return of the catamenia is no hindrance to their nursing, or even menorrhagia in a mild or severe form. Remove all children suffering from diarrhœa from the breast, and let them have cow's milk diluted with lime-water, previously warmed and given in a well-rinsed bottle, and you will cure the diarrhœa.

Many children are reared entirely on Swiss milk, and this will now and then agree far better than cow's milk. Sometimes milk, in any form and however pure, will keep up the diarrhœa, and then cold barley-water, or cold water thickened with isinglass, will be necessary, or thin water arrow-root, to which a few drops of brandy may be added should the child be exhausted. Sometimes a powder containing two or three grains of rhubarb and carbonate of soda will neutralize the acidity which has resulted from the fermentative products of digestion, and set the little patients right with magical quickness. If the evacuations are free from mucus and blood, and there is no pain, a mild mixture of sulphate of magnesia and tincture of rhubarb may be prescribed in some cases with advantage. A drop of ipecacuanha wine in plain water, or mucilage and water, has been recommended, and it will often succeed.

Children are liable to diarrhœa at this season of the year from heat, and the excitement of traveling, and change from healthy country places or the sea-side to the contaminated air of London.—*W. H. Day, M.D., in British Medical Journal*.

BROMIDE OF POTASSIUM IN THE DISEASES OF DENTITION.—As bromide of potassium has been applied to nearly every disease to which flesh is heir, anæmia and gastritis perhaps not excepted, I supposed,

until recently, that the value of this agent in the disorders of dentition was well understood, and that it was frequently used. Finding the application of it to that class of disorders quite a novelty to many, I will give my experience, hoping to awaken attention to it from those possessing larger fields of observation, to verify or disprove my conclusions.

I have used bromide of potassium in about one hundred cases of infantile diseases, embracing those of diarrhœa, pulmonary congestion, and cerebral congestion, arising from dental irritation. I have seen the diarrhœa which had defied chalk, acetate of lead, calomel, catechu, opium, the sulphites, and pepsin, yield in forty-eight hours to this bromide. I have seen persistent vomiting, which is often, in such cases, naught else but reflex action from the brain, cease after a full dose of this agent. I have seen the hot head, with gritting of the teeth, pre-sagers of convulsions, yield to a few doses. I have seen pulmonary congestion, dependent on the same cause, yield in a few days.

The most marked case I recollect was in a daughter of Mr. Pickett, of Frankford Arsenal. I had diarrhœa and both cerebral and pulmonary congestion to contend with, and at the time I resorted to the bromide of potassium the case seemed hopeless. Under its influence she made a rapid recovery.

The dose must be adapted to each case.—*C. G. Polk, M.D., in Medical and Surgical Reporter.*

CLEANSING AND SMOOTHING PALATINE SURFACE OF RUBBER PLATES.—After removing a rubber plate from the flask, it is to be cleaned, which can be much facilitated by using a small wire brush. All the plaster and roughness can be readily removed from the palatine surface where it is difficult to reach with any other instrument. The brush should be made of very fine brass wires, bound together with a stout wire (like the file-cleaner), in a bundle not exceeding an eighth of an inch in diameter. This is a convenient instrument in the laboratory for other purposes, and a trial will insure its use.—*B. M. Wilkerson, in American Journal of Dental Science.*

CEMENTING METAL TO GLASS.—Take two parts finely-powdered white litharge, and one part dry white lead, mix intimately, and work up with boiled linseed oil and lac copal to a stiff dough. One part of copal is taken to three parts of boiled oil, and enough litharge and white lead added to make a dough similar to putty. The underside of the metal is filled with the cement, and then pressed upon the glass, the excess of cement being scraped off with any sort of instrument. It dries quickly and holds firmly.—*Journal of Applied Chemistry.*

A SUPERIOR GLUE.—Dissolve 3 parts of india-rubber in 34 parts of naphtha. Heat and agitation will be required to readily effect the solution. When the rubber is completely dissolved add 64 parts of finely-powdered shellac, which must be heated in the mixture until all is dissolved. This mixture may be obtained in sheets like glue, by pouring it when hot upon plates of metal, where it will harden. When required for use it may be simply heated in a pot till soft. Two pieces of wood or leather joined together with this glue can scarcely be sundered without a fraction or tearing of the parts.—*Journal of Applied Chemistry.*

MARINE GLUE.—This is made by dissolving 1 pound caoutchouc, cut into small pieces by means of a wet knife, in 4 gallons of wood naphtha. The solution of the gum should be aided by frequent stirring, and will usually occupy ten to twelve days. Two pounds shellac are now melted in an iron ladle, and one pound of the solution stirred in, and the glue poured out to cool upon slabs. It is both firm and water-proof.—*Journal of Applied Chemistry.*

TO CLEAN FILES.—A correspondent, L. D. D., sends us the following recipe: "Boil the files in a solution of water and saleratus until they are thoroughly cleansed of outside dirt; after which, wash them in warm water. Put a pint of warm water in a wooden dish, in which stand as many files as the water will cover. Add to this two ounces of borax and two ounces of blue vitriol finely pulverized together. Stir up the files well, and add two ounces of sulphuric acid by weight, and then quarter of an ounce of vinegar. The files will turn red at this point in the process. When they again resume their natural color, take them out and wash them in cold water; after which, oil with sweet oil, and wrap singly in brown wrapping-paper, which will absorb the oil from the files.

The files will be clean by this mode in about half an hour after they are put in.—*Scientific American.*

TREATMENT OF SALIVATION BY ATROPIA.—The patient, a woman of sixty-eight years, had had two attacks of apoplexy followed by hemiplegia of the left side. On being admitted into Dr. Ebstein's wards (Breslau Hospital), profuse salivation was observed. According to the patient, it had begun a month previously. Atropia was administered internally without any effect. On the dose being increased, the quantity of saliva diminished. Atropia (the sulphate) was then injected hypodermically, and after seven minutes the salivation was stopped. On doubling the dose, the secretion was arrested for twelve hours. Dr. Ebstein explains the action of the drug through its influence on the permanent irritation of the secretory fibres of the salivary glands.—*The Lancet.*

TOOTH-PICKS.—The tooth-pick is certainly a hygienic instrument. Hence its consideration is within the province of a medical journal; wherefore we abstract the following remarks of S. Phillips Day from a recent number of the *Food Journal*, for the edification of our readers. Mr. Day may be master of anathema,—may be a Beau Brummel in society,—but he certainly is wrong in asserting that the proper use of the tooth-pick is injurious to the teeth:

* * * * *

"Some persons in America are particularly addicted to the foul practice of using tooth-picks. In fact, not satisfied with the vigorous employment of such weapons during meals, they are said to carry them in their mouths out of the dining-room, and to keep digging at their teeth or else twirling them between their lips for an indefinite period. This is an amusement equal to 'whittling;' and 'a certain Yankee,' as has been incisively observed, 'can "whittle" a tooth-pick out of a pine log.'

"Nothing can well be more revolting to sensitive, cleanly persons than the habit of picking the teeth, either at meals or afterwards. The material of which the nasty instrument of torture is made, whether of

wood or quill, does not render the practice less reprehensible. I lately observed in a shop-window in Holborn a box of pretty-looking 'diaphanous' tooth-picks imported from France; and it sorely grieved me to think that so much ornamentation should be bestowed upon such injurious articles. The use of tooth-picks should not be tolerated in civilized society, especially in what is termed 'good society.' Negroes do not need such things; then why should the white man? Savages can get on very well without such skewers; then why should Christians patronize them? Besides, they are highly injurious to the human teeth, creating apertures between them, destroying the delicate enamel which protects them, thus inducing premature decay. Therefore, both on the grounds of decency and health, the tooth-pick should be universally eschewed."—*Phila. Medical Times*.

HINTS AND QUERIES.

BEFORE you can possibly be safe in dealing with Nature, you must get two or three kinds of cross proofs, so as to make sure not only that your hypothesis fits that particular set of facts, but that it is not contradicted by some other set of facts which is just as clear and certain.—**PROF. HUXLEY.**

Do the teeth require a constant supply of the osseous constituents after they are once fully formed?—**CHARLESTON.**

REPLY TO "P. R."—"Chloroform failing, what is best to relieve severe pain after extracting?"

Rinse out socket, and have ready a smooth probe, wrapped with cotton, and saturated with liquid carbolic acid, full strength; thrust it clear to bottom of socket and leave it there, as it will easily slip off the probe. Half an hour is time enough to leave it. Try, and report.—**S. E. H.**

REPLY TO "C. G.," IN DECEMBER COSMOS.—Liquid nitrous oxide is used extensively by that class of dentists who do not care to be troubled with the making of it, with great satisfaction.

It may be more expensive, but if the absorption of gas when standing over water, and the breakage of retorts, is considered, I think it doubtful.

The best feature of this gas is that it is always fresh and always ready. I don't think I have had to turn away a single patient since I have commenced to use it. This is easily managed by always keeping a spare bottle on hand.

I have administered it without an assistant since October, 1871. My method is to place the surgeon's case on a table, about the height of my elbow, at my right hand; insert the gag; grasp the mouth-piece between the second and third fingers of the left hand, the nose between the first and second fingers, the thumb and third finger compressing the lips. This leaves the right hand free to turn on more gas, take the pulse, or to make any little forgotten adjustment of patient or instruments.—**E. F. H.**

THE REMOVAL OF DÉBRIS IN THE PREPARATION OF CAVITIES.—**Dr. H. F. Libby** writes of the advantages of a camel's-hair brush in removing the débris from a cavity in preparation, the moisture from the mouth-mirror when in use, and the tooth-substance from the relaxed surface of the rubber dam. He recommends a brush half an inch long, compact and pointed, such as can best be procured at stores where artists' implements are sold.

THREE YEARS' EXPERIENCE WITH A NEW FILLING FOR NERVE-CANALS.—A quite extended experience with different materials, ranging from gold and tin to Hills' stopping or zinc and cotton, and lastly, orange-wood, has secured for me by far the best results for the latter.

Three years ago a lady came to my office with a pivot tooth in her hand, the pin being left in the root (central incisor); she had used the tooth for twelve years. Upon taking the pin out of the root, to my surprise it was perfectly sound, and with a very perceptible odor of creasote. The patient informed me that a Dr. Ames had inserted the tooth, and that the pin had been soaked in creasote some time before mounting the tooth. She had never experienced any trouble, and the root was sound, and firm in the process. It occurred to me at once that orange-wood might with success be used for filling canals after extraction of the nerve. I then made some two or three dozen pins, shaped to conform to the different nervo-cavities,—some flat, some round, and still others short, long, slim, pointed, thick, and blunt (for enlarged cavities), and placed them in a small vial half full of carbolic acid. As occasion required, I used these in my practice, and have had better success than I could expect from my past experience with other material.

I have not lost a single tooth, or had trouble from periosteal difficulty, unless from my own careless manipulation. I believe if every dentist will use orange-wood of the proper shape, use good judgment in preparation, in cleansing cavities, and filling in the above manner, he can make better and more perfect fillings of nerve-canals than by any other known process. The wood, being soaked for a long time in the disinfectant, becomes thoroughly saturated with it, and will retain it longer than cotton, gold, tin, or any other filling extant used for the same purpose.

I had a prominent dentist ask me, if I filled the root with cotton, why not fill the cavity with cotton also? Although that was when I was a cotton man, I did not try to answer his question. But I daresay if the *same* dentist will try wood (if he has not already done so), he will be perfectly satisfied to use gold for the cavity filling, and wood for the canal and for holding his disinfectant.—C. M. RICHMOND, D.D.S.

RECOGNITION TESTIMONIAL.—The following testimonial, beautifully engrossed, has been forwarded to Mrs. Horace Wells:

At a meeting held on the 25th of March, 1873, at 6, Cavendish Place, London, W.:

It was resolved that the sum of money subscribed by several members of the medical and dental profession, and others in England, be forwarded to Mrs. H. Wells, as a slight testimony to the merits of her late husband, Horace Wells (of Hartford, Connecticut, U. S.), to whom the world is indebted, not only for the introduction of nitrous oxide as an anæsthetic, but also for giving that impetus to the study of anæsthesia which has resulted in the introduction of ether, chloroform, and various other agents for effecting that object.

Signed, on behalf of the Committee,

JOHN ERIC ERICHSEN,	<i>Chairman.</i>
JOSEPH T. CLOVER,	
F. WOODHOUSE BRAINE,	} <i>Treasurers.</i>
CHARLES JAMES FOX,	
EDWIN SERCOMBE,	} <i>Secretaries.</i>

ANCIENT DENTISTRY.—In a recent visit to London I was permitted to copy from an almanac, now in the possession of Mr. James Parkinson, dentist, 86

Sackville Street, London, the following advertisement. It appeared in the "Stationers' Hall Sheet Almanack," published in 1709, in the reign of Queen Anne:

"Sets of Teeth set in so well as to Eat withal, and worn years together undiscovered. Also Teeth Cleaned and Drawn by John Watts, operator, in Raquet Court, Fleet Street. He applying himself wholly to that Business."

Mr. Parkinson also showed me a ledger kept by his grandfather, and, at my request, made some extracts from it, which I have thought might be of interest to the readers of the DENTAL COSMOS.

The John Watts of the above advertisement was the predecessor of Mr. Parkinson's grandfather.

Wm. Budmore, who was a partner of Mr. Watts, held the appointment of dentist to the Royal Family, which appointment was subsequently held in succession by Mr. Parkinson's grandfather, his son, and grandson, and then passed away. These all practiced their profession in the same house in Raquet Court. Mr. Parkinson, being the last proprietor, disposed of the old house in 1858. The entries copied are selected from the ledger of 1789, in which year the gross receipts of the business were £2886 8s. 6d.

			£	s.	d.
Jan.	29th.	1 tooth leaded.....		10	6
Feb.	1st.	1 " "		10	6
"	16th.	1 " stopped, gold.....	1	1	0
"	"	2 teeth leaded	1	1	0
"	21st.	1 tooth leaded.....		10	8
"	30th.	New pivot.....	1	1	0
March	6th.	Lady A.			
"	"	17 teeth drawn.			
"	28th.	Gold plate to lower front teeth.			
"	30th.	2 teeth leaded.			
"	"	Impression.			
"	31st.	Gold plate, one tooth.			
April	2d.	2 teeth stopped, gold.			
"	6th.	1 tooth drawn and replaced.			
"	7th.	4 natural teeth on plate.			
"	16th.	1 tooth leaded.			
May	5th.	Upper set complete.....	10	10	0
"	7th.	2 teeth leaded.			
"	14th.	1 tooth leaded.			
"	15th.	1 tooth drawn and replaced.			
"	26th.	Teeth tied with gold wire.			
June	10th.	1 tooth drawn and replaced.			
"	15th.	2 teeth leaded.			
"	17th.	1 tooth replaced.			
"	20th.	Lady Abergavenny.			
"	"	3 teeth on plate, and			
"	"	1 tooth on plate for her woman.			
		Charged £20, paid £30.			
July	6th.	2 teeth stopped with gold.....	2	2	0
"	7th.	9 " on plate.....	10	10	0
"	"	2 " leaded	1	1	0
"	14th.	2 " replaced.....	2	2	0

			£	s	d.
July	15th.	2 teeth filled with gold.....	2	2	0
"	30th.	1 tooth " " "	1	1	0
"	"	2 teeth stopped	1	1	0
Aug.	8d.	2 teeth stopped with gold.....	2	2	0
"	10th.	New gold pivot to natural tooth and roots filled with gold.....	2	2	0
"	19th.	2 teeth leaded.			
"	24th.	8 " on frame.....	9	9	0
"	29th.	1 tooth leaded.....		10	6
"	31st.	Gold wire on front teeth.			
Sept.	8th.	Whole set complete.....	21	0	0
"	19th.	Lady Harriett Hay.			
"	"	1 hour's trouble.....	1	1	0
"	24th.	Lady Godolphin.			
		2 teeth drawn.....	2	2	0
Oct.	19th.	Lower set complete.....	10	10	0
Nov.	3d.	8 pivot teeth.....	6	6	0

Some of the above charges illustrate, as Mr. Parkinson wrote me, that "there is nothing new under the sun."—GEORGE H. CHANCE.

DENTISTRY IN PERU.—When, as the mails arrive, and I note the great strides of progress that are being daily made, both in America and England (I receive the *DENTAL COSMOS* and the *British Journal of Dental Science*), I cannot refrain from comparing the practice there to the style of work done here.

It is only with the greatest difficulty that I can persuade a patient who has an aching tooth that it is not necessarily lost; and very few, even the most refined, will submit to a lengthy operation in filling, or ever care to give a second or third sitting for any work.

Their notions of artificial dentures are limited to "taking the measure," and then returning to get them "put in;" while their ideas of filling are comprised in the use of unwashed amalgam (generally coin-silver and mercury). Gold was almost unknown a few years ago in its relation to the filling of teeth.

I introduced mallet-filling here sixteen months ago, and experienced the greatest difficulty in getting patients to submit to it.

There have lately arrived here three or four Cubans, who graduated at the colleges in your city, and it may be that some system may soon be devised which will teach the public to appreciate correct practice.

Applicants to practice the profession are examined by a board of medical men appointed by the dean of the faculty, and are expected to answer any questions on anatomy and physiology of the head and face, while the practical demonstration required is generally an extraction; and if there is no live subject, a *dead* one is taken in one of the hospitals.

If the aspirant is accepted, he is honored with a university diploma in the name of the nation, stating that he has been examined and found competent, and thereby authorized to practice, free of all restraint, in any part of the republic.

Very little attention is paid to any foreign diploma, and when a new dentist arrives he is not allowed to practice in Lima until he can pass his examination in *Spanish*. He can, however, go into the provinces, where no one will trouble him.

As yet there is no regular dental depot where goods may be had, and thus we are compelled to get them out through American and English houses here. In this respect Peru is far behind her sister-republic Chili, in whose capital Santiago

goods of American, English, and French manufacture may be obtained at an advance of one hundred per cent. on first cost,—which is a small matter, as prices for all work rule high.

There are also some first-class operators in Chili, including both English and American.

Nitrous oxide is also given by several, but the people are afraid of it, and it scarcely pays for its manufacture.

Here in Lima an enterprising American introduced it some three years ago; he got into a controversy with the medical faculty, which ended in his imprisonment, since which time it has not been popular.

I am afraid it will yet be many years before dentists in Peru will cease to share work and honors with the barber.—W. H. KELLER, LIMA.

TO THE EDITOR OF THE PHILADELPHIA MEDICAL TIMES:

DEAR SIR,—I have noticed the article which appeared in the last issue of the *Medical Times* under the heading of "Notes and Queries," selecting me as a subject through whom a thrust at the dignity of the dental profession might be made, and implying my professional status as being questionable. I trust you will do me the simple justice to publish a brief reply. First, I am a regular graduate of dentistry; second, I have adopted the administration of nitrous oxide for the painless extraction of teeth as a *special business or practice*. I do not practice dentistry, therefore the dental profession is not in any manner responsible for my business. My position in relation to the dental profession may be likened to that of the apothecary in his relations to the medical profession. The medical practitioner would not enjoy being obliged to compound his prescriptions; and the manufacture and administration of nitrous oxide involves so many troublesome details that it is a like convenience to the dentist to be able to send his patient to some one who makes a special business of that branch. The fact that I advertise renders me ineligible to become a member of the dental societies; and, being fully aware of this, I have never sought to become one. Therefore I am not a suitable subject through whom to make a thrust at the status of the profession. Neither am I a proper subject for unkind or personal criticism. I am conscientiously following a humane calling, and know that I am doing a vast amount of good in relieving the sufferings of my fellow-beings, and have every reason to believe that I enjoy the confidence and respect of the majority of our most eminent men in the medical and dental professions, and of the people of Philadelphia. Dentists in regular practice who have attempted to use nitrous oxide have generally been discouraged in using it, and many have abandoned it as an anæsthetic; why? It is because it is a very peculiar business, requiring great experience to enable one to make it successful. I am charged, because I have made use of the public press to place my name and business before the public, with violating my professional trust, and ignoring the "code of ethics" of the profession. To say the least, this is a discourteous fling, when it is considered that had it not been for the public press the community would not be reaping the benefits of this great boon, as the professions did not, and would not, accept it in the character of an anæsthetic until it became so popular through this medium that they were obliged to award it position as such.

Trusting the next effort made to impugn the status of dentistry as a profession may find a more suitable scapegoat than your humble servant,

I am, very respectfully, yours,

F. R. THOMAS, D.D.S.

PHILADELPHIA, January 8th, 1874.

VULCANITE LITIGATION.

PORTLAND, January 17th, 1874.

ON the fourteenth, fifteenth, and sixteenth insts., before the Hon. George F. Shepley, United States Circuit Judge, sitting in equity at Portland, Maine, the cause of the Goodyear Dental Vulcanite Company and Josiah Bacon against Daniel H. Smith was argued. This was the case selected by the Company and Mr. Bacon from those in which were set up the defences already made familiar to the readers of the DENTAL COSMOS in the supplement to the November number. Mr. Dickerson and Mr. Lee argued the complainants' case. Mr. Baldwin presented the points of defence, and in connection therewith read and filed a written argument submitted by Judge Black.

Judge Black was unable to attend in person, by reason of engagements which detained him at Washington. Dr. Smith was also represented by E. O. Shepard, Esq., of the firm of Messrs. Jewell, Gaston, and Field, of Boston, his immediate counsel of record.

The argument occupied some seventeen hours, about equally divided between the complainants and the defendant.

The Judge patiently and indulgently heard the case presented at the greatest length desired by either party, and for that purpose extended the time very largely beyond the limits fixed by the rules of court. We purpose to publish at least a synopsis of the argument on both sides, but not until the decision shall have been announced. Meanwhile, we congratulate the profession upon the fact that the hearing has been had, the questions presented and submitted, and the determination of those questions confided to a Judge whose deportment and character give an impress to the argument of the cause which assures us that, whatever may be his conclusions, they will be the fair convictions of a judicial mind after careful consideration and with a clear comprehension of all the matters of fact and of law involved in the record.

When the decision will be announced we cannot conjecture, but it

will, no doubt, be promptly rendered, and we can now only look for it with the solicitude which all the profession will share, and with the sanguine expectation based upon the same grounds which have always been our reliance, and which, after being argued faithfully, have been confided to a court which commands universal respect.

With the publication of the arguments we shall take occasion to make a somewhat extended statement of our own attitude in this litigation, such prominence having been given thereto by the complainants' counsel at the hearing as to make it a leading feature of their side of the case; otherwise we should not feel it incumbent on us to say a word in that behalf.

SAMUEL S. WHITE.

THE DENTAL COSMOS.

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PHILADELPHIA, MARCH, 1874.

No. 3.

ORIGINAL COMMUNICATIONS.

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

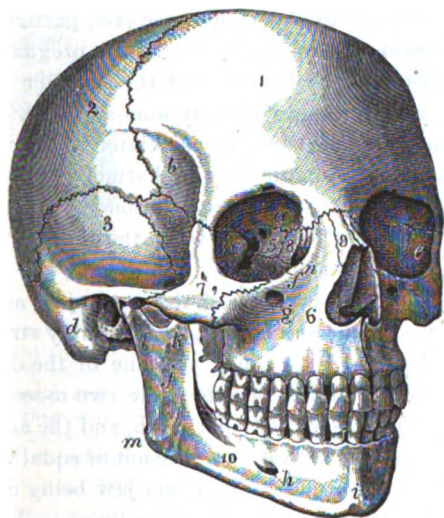
PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 67.)

THE UPPER JAW.

In a surgical sense, the upper jaw is not synonymous with the upper jaw-bone. The latter is the same as the superior maxilla; but the

FIG. 14.—THE SKULL, SEEN PARTLY IN FRONT AND ON THE RIGHT SIDE.



1, frontal bone; 2, parietal bone; 3, temporal bone, its squamous portion; 4, the sphenoid bone, temporal surface of its great wing; 5, ethmoid bone, its orbital surface; 6, superior maxillary bone; 7, malar bone; 8, lachrymal bone; 9, nasal bone; 10, inferior maxillary bone. *a*, orbital plate of the frontal bone; *b*, temporal surface; *c*, orbital surface of the great wing of the sphenoid bone; *d*, mastoid portion of the temporal bone; *e*, orbital surface of the malar bone; *f*, orbital plate of the superior maxillary bone; *g*, infra-orbital foramen; *h*, mental foramen; *i*, symphysis; *j*, ramus; *k*, coronoid process; *l*, neck supporting the condyle; *m*, angle; *n*, lachrymo-nasal duct.

former not only excludes part of the maxilla, but includes other parts belonging to adjacent bones. Thus, when the section included in an

excision of the upper jaw is examined, the nasal or ascending process of the superior maxilla is absent (being retained in position in the inter-orbital space), while portions of the palatal and malar bones and the turbinated bones are seen in position. Such an excision implies in reality a section of one-half of the face, excepting those small portions entering into the space between the eyes. Indeed, while the superior maxillæ, like the inferior, are retainers of teeth, they differ in this regard,—that in mastication, the two superior maxillæ unite to form a passive, while the single inferior maxilla is an active factor. The superior *must* be held in intimate association with other parts to successfully resist the blows dealt upon it from beneath. Hence the necessity of considering neighboring bones in connection with it.

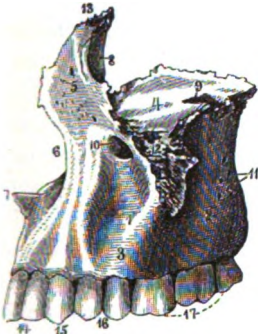
Let us glance for a moment at some of these relations. The immobility of the upper jaw rests upon three buttresses,—the nasal, the zygomatic, and the pterygoid processes. These cannot be separated without violence in an excision. The nasal and zygomatic processes are at once sawn through, and the frequently ossified junction at the pterygoid process depends as much on the pyramidal process of the palatal bone as the maxilla. Humphry* informs us that the hinder wall of the superior maxilla is liable to give way and remain behind in the operation for the removal of the upper jaw, particularly when it is the seat of malignant disease. Now, it is a pregnant fact that the malar bone is perforated by branches of the superior maxillary nerve. If we are to apply here the law already announced, that areas supplied by branches of the same nerve are co-associated in function, we will see at once that the malar is functionally in harmony with the maxilla,—a truth in no way dissonant with the relations of the same bone with the temporal and masseteric muscle, when the masticatory significance of the entire region is remembered.

The mechanism of the occlusion of the lower jaw against the upper is briefly as follows: The fixed upper jaw is forcibly struck in every act of elevation of the lower jaw along the line of the dental arch. To distribute this force, we have on either side two osseous pillars,—the root of the malar process for the molar teeth, and the ascending process for the canine tooth. These, however, are not of equal value, for the act of striking is not a simple one. The lower jaw being composed of two curved levers uniting at a symphysis, the side of each lever is seen to be stronger than its curved incisorial end. It is actually strongest at the position of the canine and first bicuspid tooth. It is at this point—the seat of prehension—that the main shock of “the bite” is received, and thence distributed along the axis of the canine tooth to the anterior border of the lachrymo-nasal groove (turbinated crest), which in

* The Human Skeleton, p. 280.

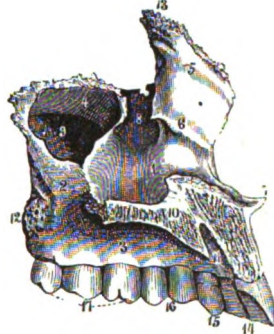
turn transmits it to the outer and thickened border of the ascending process to the inter-orbital space, where it is broken up, the main portion continuing along the anterior wall of the frontal sinus to the vertex of the skull. The main line answering to the direction here described may be called the *canine pillar*. The *malar pillar*, judging from the force of occlusion of the jaws at its site, would at first sight appear to be stronger than the former. But this is not the case. A moment's consideration of the shape of each molar tooth with its three divergent fangs is conclusive that the force of "the bite" here is diffused, thus having but a remote relation with the malar process. Besides, the "grinders" do not require the same axial support as the "seizers." The "cutting" series, in its turn, is weak,—the lower teeth slipping behind the upper. The unpleasant sensation when these teeth are "put on edge" is due to the inefficient support secured from the incisorial portion of the upper jaw.

FIG. 15.—SUPERIOR MAXILLA OF THE LEFT SIDE, OUTER VIEW.



1, body; 2, tuberosity; 3, alveolar border; 4, orbital plate; 5, nasal process; 6, nasal notch; 7, nasal spine; 8, lachrymal groove; 9, entrance of the infra-orbital canal; 10, infra-orbital foramen; 11, orifices of the posterior dental canals; 12, malar process; 13, articulation for the internal angular process of the frontal bone; 14, incisor teeth; 15, canine tooth; 16, premolar teeth; 17, large molar teeth.

FIG. 16.—SUPERIOR MAXILLA OF THE LEFT SIDE, INNER VIEW.



1, nasal surface of the body; 2, surface of the palate bone; 3, alveolar border; 4, orbital plate; 5, nasal process; 6, ridge for the articulation of the turbinated bone; 7, nasal spine; 8, groove contributing to form the lachrymo-nasal duct; 9, maxillary sinus; 10, palate plate, its articulating border for the right maxillary bone; 11, incisive foramen continuous with the naso-palatine canals; 12, tuberosity; 13, articular extremity for the internal angular process of the frontal bone; 14, incisor teeth; 15, canine tooth; 16, premolar teeth; 17, large molar teeth.

With the understanding, therefore, that for a satisfactory study of the upper jaw some account of the malar and palatal bones is required, we will describe these after the superior maxilla,—leaving the turbinated bones for another division of our subject.

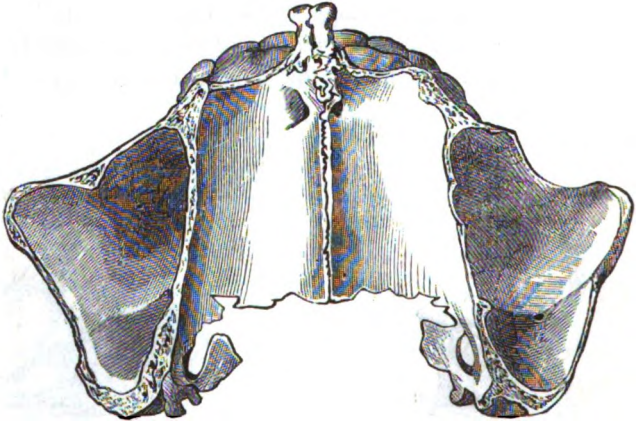
The Superior Maxilla.—The superior maxilla presents a very irregular form. It occupies the space between the orbit and the mouth,

—the zygomatic fossa externally, and the outer wall of the nose internally. It assists in forming the floor of the orbit, the outer side and floor of the nose, the anterior nares, and affords lodgment for teeth.

It presents for examination a central portion or body, and the nasal, palatal, malar, and alveolar processes.

The Body.—The boundaries of the body correspond pretty accurately to the shape of a large cavity—the maxillary sinus. The antero-posterior section of the body bisects the sinus at the position of the first molar tooth. It is thus seen to be more or less triangular. One side

FIG. 17.



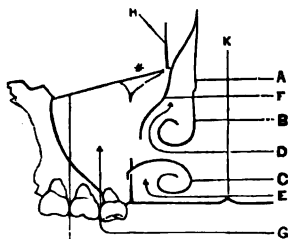
Section of the two superior maxillæ near the level of the floor of the nose, showing sections of both sinuses.

of the triangle forms the floor of the orbit; another imperfect one, the nasal border. Between the nasal and the orbital borders lies the facial border. A horizontal section just below the infra-orbital canal yields the nasal and facial borders as before. The posterior border is now seen as a convexity directed toward the zygomatic fossa, hence its name, the zygomatic surface. The size of the maxillary sinus is subject to great variation. It may extend into the malar bone. It is occasionally divided into compartments by incomplete vertical septa.

The *orbital* surface of the body is a nearly smooth plane, slightly oblique from within outward. Its inner edge articulates with the lachrymal bone and the os planum of the ethmoid. Its outer edge joins the malar bone at its anterior half, and forms the inner border of the spheno-maxillary fissure at its posterior half. It is marked by a groove running from behind forward, which terminates in a canal near the front edge. This is the infra-orbital groove and canal for the transmission of the infra-orbital nerve and artery. The orbital surface may serve to cover in the nasal chamber at the side of the middle meatus.

The *inner* or *nasal* surface is imperfect. It presents an upper and a lower plate, with a large irregular opening between them. When the bones of the face are in position, this opening is partially closed by the palatal bone, the ethmoidal process of the inferior turbinated, and the uncinat process of the ethmoid.

FIG. 18.—DIAGRAM OF THE RELATION OF THE SUPERIOR MAXILLA AND THE INTERNAL NOSE.



A, B, the nasal lamella of the ethmoid bone. A, the superior turbinated scroll. B, the middle turbinated scroll. C, the inferior turbinated bone. D, the middle meatus, leading upward to the space between the uncinat process and the nasal lamella of the ethmoid bone. E, the inferior meatus. F, the uncinat process of the ethmoid bone. G, the maxillary sinus. H, the os planum of the ethmoid bone. I, the orbital plate of the superior maxilla. K, the nasal septum. *, the portion of the orbital plate lying to the inner side of the opening of the maxillary sinus.

The *outer* or *facial* border is concave, and extends from the root of the malar process forwards to the median line at the anterior nares. Its junction with the orbital plate is marked by a thickened border,—the *infra-orbital ridge*,—which is continued a short distance upon the ascending process (*q. v.*). Directly below it is seen the infra-orbital for the nerve and artery of the same name. Extending from the infra-orbital foramen to the alveolar process—to the outer side of the eminence—of the socket for the root of the canine tooth, is a depression known as the *canine fossa*. Above the incisor teeth is seen a smaller depression,—the *myrtiform fossa*.

The posterior or zygomatic surface is convex. It extends from the base of the malar process to the nasal aspect of the bone, where it joins the vertical plate of the palatal bone. It is separated from the orbital plate of its own bone by a sharp line at the inner border of the sphenomaxillary fissure.

The zygomatic surface presents a rounded eminence above the alveolus for the last molar tooth, termed the *tuberosity*. Above it a short distance lie the posterior dental foramina for the transmission of the posterior dental artery and nerves. The surface presents internally an articular surface for the pyramidal process of the palatal bone.

The Nasal Process.—This is the stoutest in the region of the face. It is broader below than above, and is inclined upward and slightly for-

ward and backward to articulate by a broad, jagged extremity with the frontal bone. The origin of the nasal process is best seen from within the nasal chamber; it here presents a smooth concave surface defined in front by the sharp compressed edge of the outer border of the anterior nares, and behind by the thickened anterior border of the lachrymal groove. This border is traceable upward to appear at the outer aspect of the bone on the inner wall of the orbit in front of the lachrymal bone, so that the lachrymal groove lies upon the inner side of the nasal process below and terminates at its outer side above. The nasal process is marked within by two transverse ridges, the lower for the inferior turbinated bone, the upper for the middle turbinated. The outer or facial surface may be divided at the level of the infra-orbital ridge into an upper and a lower portion. The upper portion is slightly concave externally, and marked by minute depressions thought to be traces of the development of the bone. Its anterior edge is articulated with the nasal bone. The infra-orbital ridge is here observed to form the anterior border of the lachrymal groove.

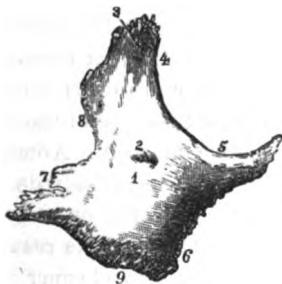
The *palatal* process is a horizontal plate of bone extending the entire length of the oral aspect of the superior maxilla. It is thinner at its middle than at either border. It is best defined opposite the second molar tooth, where it arises from the alveolar process and presents a thin transverse border for union with the palatal process of the palatal bone. It joins its fellow of the opposite side at the median line by a vertically serrate border; the upper edge of which, termed the *crest*, is produced to articulate with the vomer. The internal border of the palatal process is broader in front than behind, and it is continuous with the mesial border of the alveolar process at about the site of the anterior palatine canal. This foramen is best seen from beneath when the superior maxillæ are in position. It then presents an ovoidal depression, at the base of which is seen the median suture. Lying within this suture are the two minute naso-palatine canals. At its sides are seen the incisorial foramina. These two sets of canals transmit the terminal branches of the naso-palatine nerves from the nasal chambers to the roof of the mouth. The palatal process is smooth and concave above to enter into the floor of the nose, and roughened below for the attachment of the mucous membrane of the roof of the mouth. The lateral border of this surface is grooved for the posterior palatine artery and nerve.

The *alveolar* process extends along the under margins of the facial and zygomatic surfaces. It is a stout curved mass of spongy bone, placed at the sides of the hard palate and curved forward at the incisorial region to join its fellow of the opposite side at the median line. It is well defined within the cavity of the mouth, where it forms an angle to the palatal process. On the facial and zygomatic aspects it is

continuous with the body of the bone. The alveolar process is divided into eight sockets or alveoli, corresponding in size and shape to the teeth; those of the molar teeth being broad, the canine circular, and the incisors somewhat compressed from side to side. The base of the sockets for the roots of the first and second molars may appear as eminences within the maxillary sinus. That of the canine tooth is the deepest, and forms an eminence (canine eminence) on the facial border, reaching half-way to the orbit.

The malar process is broad, and seen at the junction of the facial and zygomatic surfaces. It is directed horizontally outwards, and articulates with the malar bone. It is occupied by a small portion of the maxillary sinus.

FIG. 19.—OUTER VIEW OF THE RIGHT MALAR BONE.



1, external or facial surface; 2, malar foramen; 3, frontal process; 4, 5, orbital border; 6, maxillary border; 7, zygomatic process; 8, temporal border; 9, inferior border.

The Malar Bone.—The malar bone is situated at the side of the face, where it joins the cranium. It forms part of the temporal fossa and the anterior portion of the outer border of the orbit. It is associated with the zygomatic process of the temporal bone to form the zygomatic arch. It presents for examination a maxillary, zygomatic, and frontal processes.

The *maxillary* process is broad and irregular. It articulates with the malar process of the superior maxilla. The *frontal* process forms the latter inferior third of the edge of the orbital margin, to articulate at the external lateral process of the frontal bone. A thin plate is directed inward from the frontal process its entire length, to join the great wing of the sphenoid bone. It is called the *orbital plate*, and helps to separate the orbit from the temporal fossa. A small portion of the orbital process ordinarily remains free, and enters into the outer border of the spheno-maxillary fissure.

The *zygomatic* process is a broad thick plate of bone passing backwards from the side of the face. Its upper margin is horizontal, continuous with the frontal process to form the fronto-jugal border. Its course is oblique and continuous with the malar ridge of the superior

maxilla, to form the maxillo-jugal border. The zygomatic process is received by the corresponding process of the temporal bone through a serrate suture.

The malar bone presents a *subcutaneous* or facial surface which can be defined beneath the skin. It is smooth, somewhat convex, and furnished with several minute foramina for the malar branches of the ophthalmic nerve. A *temporal* surface is formed by the temporal aspects of the zygomatic and frontal processes, and an orbital surface by the orbital aspects of the frontal and malar processes.

(To be continued.)

ROOT FILLING.

BY HENRIETTE HIRSCHFELD, D.D.S., BERLIN, PRUSSIA.

ON reading the reports of the different conventions, I was impressed with the fact that many of the most experienced and able members of the profession still advocated the use of the solid gold filling in roots as the best and most reliable method. Admitting the value of such a filling, I think we can, at present, entirely do without it.

Our object in filling the pulp-canal is to prevent the collection of fluids, and to avoid the deleterious effects resulting therefrom. If we can accomplish this more readily by cheaper processes, it is our duty to do so.

This, however, is not my main reason for objecting to gold fillings. Observation has taught me that many times periostitis, and even the loss of the tooth, ensues, when the operation has been performed in the best manner and by the most experienced dentists. I therefore resolved at the commencement of practice to attempt another method, not being aware, at that time, that this practice was being used by others.

Considering the relations of dentistry to the public, and those of the latter towards dentistry, it is not surprising that at the present time, in Germany, we have a larger proportion of dead and exposed pulps to treat than have our colleagues in America.

I shall not dwell upon the preparatory steps necessary to be taken in different cases, as these are familiar to the profession; but when the root is in a proper condition for filling, I proceed as follows:

Select a thread of lint, separate or loosen the fibers as much as possible, and then moisten it with chloride of zinc from the cement boxes; then rub oxide of zinc well into it, omitting one extremity of the lint, which is reserved for the application of a small quantity of carbolic acid. The thread is simply the medium for conveying the cement to the extremity of the canal, and is entirely imbedded in it. The end of

the lint saturated with carbolic acid is, of course, the first inserted, and is carried directly to the apex. After the root or roots are filled, the cavity in the crown is temporarily closed with cotton and sandarac, and an appointment made with the patient several days subsequently. If, in the meantime, the tooth has been perfectly comfortable, and the patient in a healthy condition, I insert a gold filling in the crown cavity. If, on the other hand, the pulp had been deprived of vitality for a long period, and the tooth easily irritated during preparatory treatment, I fill the cavity with cement, and dismiss the patient for the time. By operating in this cautious manner, I am able to assert that I *never* had periostitis occur in the large number of teeth treated in this way.

As none of these teeth had given any trouble, I never had an opportunity to satisfy myself in regard to the condition of the root and the filling until, by an unfortunate accident, a young patient split off the labial surface of a first superior bicuspid, treated in this manner two years previously. The tooth was extracted, at her request. On splitting the root to the apex, I found, as I expected, the filling hard and perfect, and the periosteum in a healthy state.

While the foregoing practice is nothing new to old practitioners, it may be of value to beginners, who are obliged to reap the benefit of the experience of others, and have often to be checked in their eagerness to make a "fine gold filling."

I have tried in pulp-capping a very simple thing, and with satisfactory success. If an exposed or nearly exposed pulp presents for treatment, I cut a minute piece of the white rim found at the margin of postage-stamp sheets, and moisten it with carbolic acid. It is then placed carefully over the pulp, and the cavity filled with Hill's Stopping, or cement. This paper is of sufficient thickness to form a protective shield, and is not so easily dislodged as many substances recommended for this purpose. The general subject of the policy of capping I do not propose to discuss in this article.

A RAINY DAY'S WORK.

BY J. S. LATIMER, D.D.S., NEW YORK.

It is of little use to execrate the weather, which is likely to prevent our patients from keeping their engagements, so we will console ourselves with the reflection that, if we should be obliged to operate, the ethereal undulations, broken by the rain-drops, would but distress our and our patients' vision. So, even grateful for the storm, we look about for occupation.

Yes, it is a good time to prepare a tooth-section or two for micro-

scopic examination; and we go to the box of old teeth to look them over, as we have done a hundred times before. These old teeth are familiar to our eyes,—for we get no new ones in these latter days of enlightenment,—and each one has a history, which we recall as we hold it in our fingers. Here and there are specimens much cracked, and here is one entirely severed. Strange that such dense substances as enamel and dentine should shrink! for only on this hypothesis can we account for the fracture.

At this juncture it occurs to us that some months ago we put two or three freshly-extracted teeth in a bottle with glycerin and water; and we select one, and determine we will make of this cuspid a longitudinal section. So we adjust a five-inch corundum wheel to our foot-lathe, and grind away to about the center of the tooth, then smooth the surface on an Arkansas wheel, and polish by rubbing it on a piece of smooth and dry plate glass.

Then we return to the corundum wheel, and grind down the other side carefully until we have a section nearly as thin as writing-paper, when we smooth and polish as before. But during this second polishing our section dries faster on one side than on the other, and is warped, and the enamel cleft.

So we wet it again and it resumes its shape; furthermore, the opaque whiteness is somewhat modified as the water expels the air and resumes its former place.

We stop to ponder this matter a moment, questioning whether the mere filling of the tubuli with water could expand the matrix, and wondering whether the withdrawal of water from the tubuli merely could shrink the mass if the intertubular tissue is impermeable to water. But we may not tarry in abstraction, so we prepare our section for mounting by cleaning it with a camel's-hair pencil and water, then place it between folds of bibulous paper, and the paper and all between two glass slides held together by clips, that both sides may dry alike rapidly and warpage be prevented, for the value of the specimen will depend largely on its presenting a plane surface. Ting-a-ling goes the bell, and in comes a "duck." Not a "dead" one, but, as she divests herself of veil and water-proof and rubbers, she proves pretty as well as enterprising. She announces, as she takes our chair, that, as she was disengaged, and thought we might be on such a stormy day, she had come over to have a tooth filled, which, though it had not ached, was getting to be sensitive.

We examine the tooth of our pretty milliner, and find a buccal cavity, which, though not deep enough to endanger the pulp, is exceedingly sensitive. We chide her want of attention to her teeth, and explain as well as we may the causes of caries, that she may the more intelligently pursue the prophylactic treatment we are about to explain to her. To

impress our instructions by ocular demonstration, we remove a particle of *débris* from the cavity of decay and touch it to a fragment of litmus paper. A red spot immediately indicates the presence of an acid. While we are preparing the rubber dam we recommend her to use chalk with which to brush her teeth—chalk fortified with Castile soap and orris and sugar, if she prefers, but always chalk; and we take a very little of that substance and apply it to the carious cavity, which we rinse with water, and presently test for acid again, but, this time, with a negative result.

The dam being applied, we dry and excavate the cavity, notwithstanding the extreme sensibility, which neither dryness nor carbolic acid quite abates, for our little milliner is one of those who do not like to make engagements, and is very likely to break them if made; so we cannot pursue the usual course, which is to fill temporarily with oxy-chloride, and postpone excavation for two or three weeks.

Finally, the cavity is filled, and ready for the removal of the rubber preliminary to the dressing-down and finishing process.

But as we find a cavity on the grinding surface of the same tooth, and as this "duck" must be taken on the wing, if at all, we and she conclude to proceed while we have the rubber on. And so, three hours after putting the rubber on, we remove it, and both the patient and ourself notice how much whiter the dried teeth (though their *surfaces* are now wet) are than their undesiccated neighbors.

The "duck" asks us why this difference of color. We ponder a moment, and then reply by placing a drop of water on a bit of white paper, and holding it up between her eyes and the leaden sky. You perceive, we remark, that the paper is relatively white and opaque where it is dry, but has been rendered partially translucent by the water where wet. Continuity of the particles of a mass is essential to the ready passage of light through that mass. That continuity is furnished, in some degree, by the water in both the tooth and the paper. Some substances, as the essential oils and fatty matters, transmit the light much better than water, filling the spaces in the paper and rendering it quite translucent.

The "duck" listens attentively, heaves a deep sigh when we have finished, then plumes her feathers and resumes her aquatic habits.

Going down to lunch, we incidentally mention to the other and better part of us that this damp weather is bringing on a few twinges of our old acquaintance, rheumatism. Wife prescribes lemons (all wives are doctors), and so we eat one after lunch. Youngster likes lemons, too, and does not see why he must wait for rheumatism before he can have one; so he gets one without a prescription.

We both find our teeth "on edge," though his are young and mine old, and both are free from caries. Johnny expresses a desire to know

why "sour things" should make his teeth sore. We recall the biblical saying concerning the consequences to the children of the consumption of sour grapes by their parents, but we wisely refrain from mentioning it, merely remarking that many people older and wiser than he had asked that question without getting the answer. We then recommend him to follow our example, and we proceed to brush our teeth well with a dentifrice containing chalk and soap, with some additions to make the powder palatable. The acid thus neutralized, we have no further discomfort from tooth-edge.

Returning to the office, we ponder Johnny's query. Surely, we say to ourself, the enamel is not sensitive. Every one says that, and it must be true. We invite Professor Kölliker to come down from the shelf and inform us concerning this curious connecting link between the mineral and animal kingdoms, which we denominate enamel. Turning to page 478 ("Microscopical Anatomy," American edition), we read: "The prisms of enamel are united very intricately, without any intermediate substance. I have not been able to convince myself that canals constantly exist between the prisms, but it is certain that cavities of various kinds may be not unfrequently found in the enamel. Such, for instance, are—1. The continuations of the dentinal canals into the enamel, to which reference has been made above, with the elongated cavities at the border of the dentine which arise from their expansion; and—2. The cleft-like gaps in the middle portions of the enamel, which are not in communication with the preceding, are never entirely absent in any enamel, and often occur in very great numbers, as narrower or wider spaces which, however, never contain air."

In a foot-note the translator says, "With respect to this point (spaces between enamel prisms) opinions differ; Todd and Bowman consider that canals normally exist between the enamel prisms. Tomes finds canals in the enamel prisms of young animals, and sometimes in a part or the whole length of them in old teeth. Kölliker ('Micr. Anat.,' 77) has not yet observed any such cases. Czermák believes that in a few cases he has observed 'very numerous delicate enamel tubules arranged in close series.'" On the following page is an excellent cut descriptive of the author's idea, and which reminds us forcibly of a section of tooth exhibited at a late meeting of the Odontological Society by Professor Hitchcock, of Boston, in which the spaces between the enamel prisms were singularly evident.

We open the drawer in which we keep our microscopical treasures, get out the neglected microscope, and commence a search for inter-columnar spaces.

At first we are disposed to explain the appearances on which the eminent gentlemen based their opinions, on the hypothesis that fissures in the enamel caused by unequal contraction in drying had been mis-

taken for ante-mortem cracks or canals. But a close inspection of many specimens teaches us that cracks and natural fissures are easily distinguished, and could not possibly be confounded by such veteran observers as they.

Admitting, then, the evidences of our own vision, and going back over the events of the morning, in which had been shown us that enamel and dentine are permeable by water, and by water containing acid, we ask ourselves,—ask you, reader,—Have we not here a sufficient explanation of sensitive dentine and tooth-edge?

We return to Prof. Kölliker, and find on page 494 the following concerning the spaces in the hard substance of teeth: "The functions of the lacunæ and their canaliculi in the bones are here performed by the dentinal canals with their ramifications, the lacunæ and canaliculi in the cement, and the fissures between the prisms of enamel. All these cavities, during life, contain a fluid derived, on the one side, from the vessels of the pulp, on the other, from those of the alveolar periosteum; and permit of changes in the substance, though they may be slow."

Whether, therefore, we admit Kölliker's theory of fluid contents of these cavities, or turn to Mr. Tomes's notion that those contents are soft solids (fibrils), we have in either case a medium for conveying the irritating acid to the sensitive pulp and the irritation itself to the sensorium.

ERRATIO ABSOESS.

BY J. W. KEYES, MONTGOMERY, ALABAMA.

(Report of two cases, read before the Alabama Dental Association.)

CASE 1. W. W. applied for relief from pain in left superior first bicuspid, and embracing all that part of the face. Examination showed a considerable swelling in the roof of the mouth, inclining to the left of the medial line. The bicuspid looked healthy, and was well filled with gold. The left lateral incisor was tender on percussion, and presented indications of the death of the nerve.

I lanced the palatal abscess, but no pus followed. Expecting that the pus would find its way in a short time through the opening made, I dismissed the patient to await developments. On his presenting himself a few hours later, I found everything in *statu quo*. Entered nerve-chamber of lateral incisor from palatal surface; pus followed, and relief was obtained.

Next morning the patient presented himself, complaining of great pain in the first bicuspid and desiring its extraction.

I refused to extract, but removed the filling, which had been in about one year. Found the nerve exposed at a small point, bled it, touched it with carbolic acid when bleeding had ceased, and dismissed the

patient partially relieved. He returned in about an hour, complaining much; I then applied arsenic to the nerve. In three hours he returned, complaining more than ever and insisting that the tooth should be extracted. I took it out; the buccal fang was erratic, and broke off about one-third from the end. Pus discharged from the socket, and pressure on the swelling in roof increased the flow through the palatal socket. On probing into the antrum, a large quantity of thick matter was discharged.

Entering the point of a French syringe in the opening, I drilled into the lateral incisor. Water was easily and freely thrown out from the socket of the extracted tooth.

I was puzzled: Was this a case of antral abscess *de novo*? How came this healthy bicuspid to be the prime complainer? Was the lateral incisor the cause of all the trouble?

CASE 2. Mrs. W. complains of much pain and great soreness in and above the left lateral incisor. Face swollen; lateral incisor very loose; swelling over apex of fang inclining a little to the right. Central incisor long dead, and fangs filled. Have never given any trouble; are only very slightly sore or loose,—little if any more than usual. All the trouble referred to the lateral incisor, which has a small gold filling in approximal surface; it was very painful when filled, but there was no exposure of nerve.

I desired to introduce a bistoury near the apex of lateral root, but the patient would not consent. Drilled into lateral incisor on palatal face, and found a living, healthy nerve.

My diagnosis is that in both of these cases the dead teeth abscessed, and that the matter burrowed into the socket of the complaining teeth, highly inflaming the peridental membrane, producing the symptoms of death, but leaving the internal nerve uninfamed and only highly excited.

I did wrong to bore this living tooth; the bistoury was the proper remedy.

In the first case the abscess started from the apex of the lateral incisor root, burrowed out over the roof, penetrating the socket of the bicuspid in its way; then finding an easier outlet into the antrum than through the palate, it made it, and thus occurred the gathering in both palate and antrum.

This view accounts to my mind for all the symptoms; and the treatment happened to be the best for the case.

THE ORITIO ORITIOISED.

BY J. LEE WILLIAMS.

In the *American Journal of Dental Science* for August, 1873, S. P. Cutler takes occasion to criticise Prof. Barker's work on Nitrous

Oxide. In the *DENTAL COSMOS* for January, 1874, this writer also reviews a paper on Anæsthesia, published in the *Missouri Dental Journal* for January, 1873.

The author of these communications has, I think, utterly ignored the results of many experiments that have been made with nitrous oxide. In the article first referred to, he says: "My experiments fully demonstrate the fact that the gas retards oxidation throughout the body." This assertion is repeated in substance several times during the course of the article. Now, will that writer please explain the results of the following experiments, taken from Colton's work on Nitrous Oxide: "Take two jars of equal size, filled with lime-water, pass a definite amount of air, as it comes from the lungs, through one solution, and it is rendered turbid; pass an equal amount of nitrous oxide, as it escapes from the lungs, through the other solution, and it is also rendered turbid, *but to a greater degree than the first*, indicating the presence of carbonic acid in greater quantity." If there is an increased quantity of carbonic acid eliminated, there *must* be increased oxidation. Again: "Breathe through a tube into a solution of litmus blue, and it is changed to red. It will take, we will say, fifteen seconds to effect the change (the time depending upon the quantity and strength of the solution). Now breathe nitrous oxide through another solution of the same quantity and strength, and we shall notice the change of color in from ten to twelve seconds, indicating the elimination of carbonic acid to a greater extent than the normal amount."

These experiments, conclusive as they are, are not the only argument in favor of increased oxidation. No one can fail to observe the great increase in the quantity of oxidized matter carried off by the skin and kidneys, after breathing nitrous oxide. This writer says, or implies, that the blueness of the skin and lips, difficult respiration, cadaverous expression, and other startling symptoms, are evidence of a want of oxygen, and thinks that this is proof that nitrous oxide is not decomposed in the blood, which shows that he is totally unacquainted with the effects of pure nitrous oxide, properly administered. These symptoms are *never* produced by *pure* gas administered in a proper manner, but are the effects of an increased amount of carbonic acid (the result of super-oxidation), which is retained in the system, and produces the symptoms described.

If, as Prof. Watt has explained, the valves of the inhaler are sufficiently large, and atmospheric air is freely admitted during the first few inhalations, the carbonic acid gas is allowed to escape, the breathing soon becomes tranquil, and the gas will support respiration for a long time.

I have no doubt that if pure oxygen were breathed through some of the inhalers in use, the symptoms above described would be devel-

oped, though in a less degree, because pure oxygen is not absorbed by the blood so rapidly as nitrous oxide. Nitrous oxide produces oxidation with wonderful rapidity, in obedience to a well-known law of chemistry: viz., elements just liberated from union combine with other elements with great avidity.

In the report of the Odontological Society of Great Britain, quoted by Dr. Cutler, it is urged, as an argument against the decomposition of nitrous oxide in the blood, that the liberated nitrogen, not escaping from the blood-vessels of the lungs, would rapidly prove fatal. A weak and shallow argument indeed! Did not that committee, as well as the gentleman who quoted their report, know that whenever a breath of atmospheric air is inhaled, the oxygen combines with hydrogen and carbon, and nitrogen is liberated?

If, while breathing protoxide of nitrogen, the carbonic acid is eliminated from the system as above described, the blood is of a bright scarlet color, and coagulates rapidly, proving that there is increased oxidation. Probably no one would think of disputing Dr. Cutler's argument that anæsthesia is the result of an abnormal condition, but super-oxidation is as truly abnormal as inoxygenation, although not as fatally so. In a future paper I hope to present some new and original thoughts on the subject of anæsthesia and kindred phenomena.

"RUTS."

BY CHAS. E. FRANCIS, D.D.S., NEW YORK.

To "follow in the footsteps of an illustrious predecessor" is a very commendable resolution. The noble deeds of our sires are certainly worthy of imitation. They who stand pre-eminent in the field of science, or have acquired well-earned fame as skilled artisans, will always have their admirers, and will ever be referred to as examples for emulation. A desire to excel should be the aim of every mortal, but let it not be forgotten that they who attain the greatest eminence are not mere copyists. The plagiarist may copy well, yet himself be a poor imitation of the author he admires.

In endeavoring to imitate great exemplars, it may be well to remember that they all have had difficulties to overcome and obstacles to surmount, which in many cases have taxed energy and ingenuity severely. Gathering wisdom from the experience of those who have preceded us may and should save us many blunders.

One need not wear the veritable shoes that carried a favorite leader through his march to fame, neither need he follow the exact path with its devious turnings. A better and less uneven way may lead to the same goal. Great men do not all move in the same channel to obtain

their desired ends, nor do they generally adhere to dogmatic caprices. They seek continually for something hitherto unattained, and are ever on the alert for new truths. This restless, unsatisfied desire to reach higher, to accomplish greater deeds and obtain better results, has made them famous.

If the sailor thoroughly understands the principles of navigation, he will not confine his labors to the craft of the canal. His field is the boundless ocean. Many work at disadvantage, lacking knowledge of principles. Without pulley or lever, they tug and strain until exhausted.

Innovations, to the unprogressive mind, are horrifying. They conflict with fossilized, yet cherished ideas,—ideas which in many instances have traversed several generations without changing shape or color.

We are apt to run in the old "grooves" of our fathers or preceptors. Our "cart-wheels" have become accustomed to the "ruts" they have long rolled through, and so we jog along, up-hill and down, bouncing here and there, occasionally receiving damage, yet feeling in our aching bones that we are in the correct path, for we have traveled it too often to be mistaken. An easier conveyance and a less difficult road might be constructed, saving time, strength, and patience; but that is not to be thought of, and, if kindly suggested by a more practical mind, will only cause a shrug of the shoulder or a lateral movement of the head. We find it hard to break loose from old habits. Our professional "ruts" are so natural to fall into, that it becomes a struggle to vary our course and keep out of them.

Tenaciously adhering to an obsolete idea without ever having sifted its merits, or an obstinate refusal to be convinced of its absurdity when irrefutable proofs are advanced, is, to say the least, a degree of "firmness" hardly commendable. And yet how this spirit runs through our profession!

My good friend, "Doctor" —, chuckles with great delight when declaring himself an "old fogey." He rejects all new theories, branding them as "humbugs." Modern appliances are "new-fangled notions, many of them mere toys, invented to *sell*, and of no practical-value." He sticks to his old methods, and to his clumsy, antiquated instruments, as he would to long-tried and faithful friends. In principle and practice he stands now where he did twenty or more years ago. He likes "old-fashioned tools;" prefers cotton-"wool" to bibulous paper or spunk, for drying-out cavities; rolls his foil into long coils, which he packs by much muscular effort. He contends with the copious salivary floods as did his preceptor before him, using tightly-folded napkins and old linen rags, which are unmercifully crammed into the oral cavity of the struggling patient. The rubber dam is to him a condemned nuisance. He won't be bothered with such a nonsensical arrangement, and his

description of a case where he once witnessed its application is portrayed in a manner decidedly ludicrous.

Saving exposed pulps he considers a "ridiculous notion." He believes in "killing" exposed "nerves," or, what is better, in extracting aching teeth, and "so ending all trouble."

In dental mechanism he runs in his long-tried ruts. Regulating appliances and artificial dentures are as old-fashioned in appearance as in principle.

My good friend, the "Doctor," "don't like dental societies." They are assemblies of discontented, restless enthusiasts, and their proceedings are "much ado about nothing." Neither do dental colleges meet his favor. *He* did not learn his "trade" in any college, so does not see any necessity for them.

"Doctor" — is but a type of many characters with whom we often come in contact. Many members of our profession give themselves much needless labor, and cause much unnecessary annoyance to their patients, by adhering to old rules and antiquated methods; and the persistency displayed in clinging to their views is sometimes remarkable. Although demonstrations clearly showing easier and better modes are before them, they still follow in the same old worn "ruts," and so plod along, decrying all innovations, and whatever else that tends to advance the growth of their profession.

CLINICAL REPORTS.

UNIVERSITY OF PENNSYLVANIA.

SERVICE OF JAMES E. GARRETSON, M.D.,

CLINICAL LECTURER ON ORAL SURGERY.

REPORTED BY DE FOREST WILLARD, M.D.

ALVEOLAR ABSCESS.

GENTLEMEN,—The lady, twenty years of age, now before you, presents herself with a small opening upon the left side of her face, over the base of the lower jaw, and about one and a half inches in front of its angle. About this orifice is a mammilated projection of granulations, and for a considerable distance around the skin is cicatrized and reddened. She states that there is a constant discharge of pus, and that she has had the sore since she was a year old. Now she must pardon me if I say that I do not believe that the discharge dates back one-half of that period, but that she is mistaken in her statement. I make this assertion with confidence, although I have never seen the case before, and therefore until this moment knew no more about it than do any one of you. You will find, as you advance in the profession

of medicine, that the history of many of your cases will be untrustworthy, either from wilful deceit upon the part of the patient, or more commonly through their carelessness and want of strict observation. Unless, therefore, you are thoroughly versed in the knowledge of your science and in acuteness to recognize symptoms, you will be greatly misled oftentimes in diagnosis.

It not unfrequently happens that the intelligent surgeon is able to describe to patients the symptoms of disease better even than they know them themselves. I say, therefore, to this lady, that without any intention upon her part, she has been baffling the skill of such physicians as may have been attending her, since, being misled, they evidently have not comprehended the cause of her difficulty.

I believe that the patient is suffering from *alveolar abscess*; and I base my superficial diagnosis first upon the position of the sore, and second, upon its appearance. Let us see if we cannot prove our opinion true. In the first place, it is extremely improbable that any disease would have lasted this long without producing greater loss of tissue; and also, in this region one could hardly expect to find more than two or three diseases which would give any doubt in diagnosis. We have scrofulous abscesses near this point, but there are no lymphatic glands lying directly around the base of the jaw. Again, we have necrosis or caries affecting this bone, and although one of these may be the cause of this trouble, yet I am convinced that they would not have existed for this length of time without manifesting themselves more severely. These, with parotid fistule, are about all the diseases which I can imagine to have existed for so many years.

But I am only delaying my diagnosis to show you a few of the thoughts that should pass through a surgeon's mind as he examines a case. Let us now open her mouth and examine the denture. At once I find the first lower molar carious to such extent as to expose the pulp; and now, in further confirmation of my diagnosis, I insert a bent probe into the little orifice upon the cheek, and, by a few manipulations, am able to cause it to strike the root of the above-mentioned tooth. The abscess is dental in its origin, and as this tooth—the cause—did not erupt until several years after her birth, the sinus could not have existed so long as she states. Questioning her now more closely, she recalls a very severe spell of "toothache" some four years since, and that the discharge became worse soon after this. Previous to this she may have been troubled with acne pustules or some eruption of a similar nature, and, not giving the matter close attention, may have been led to suppose that this gentle distillation of pus was but a continuance of her old difficulties.

What now is an alveolar abscess? An inflammation of the alveolar dental periosteum, uncontrolled, goes on to the formation of pus, which,

confined in the alveolus, must make its way in the direction of the least resistance of tissues. The tunneling of osseous structures is a process so difficult that the coincident pain is excruciating; but exit is at last obtained, and an open pus-discharging sinus is the result. Should the opening be upon the face, the appearances of the orifice will be such as you see before you; but if within the mouth, we would have the disease known as "gumboil" or parulis,—both from one and the same cause.

Could any treatment be more rational than to remove the offending cause? I lift this tooth from its socket, and find, as I anticipated, a softened pulpy mass at its fang, which is but altered, disintegrating periosteum, constantly producing unhealthy lymph, which, unable to organize, degenerates into thin pus and oozes from the fistule. This morbid process in the membrane consists in the accompaniment of the hyperæmia by a hyperplastic state of the tissue-cells, which increase in size as well as in number, thus accounting for the softened, fringed appearance so often seen. A recognizable hyperæmia is not, however, a necessity for the excessive proliferation of connective-tissue cells; hence it is that epulic tumors have origin in such hyperplasticity of the odonto-alveolar periosteum where expressions of vascular change have never been observed. This shreddy periosteum at the extremity of the fang usually forms a sort of pus-sac, consisting of half-organized or retro-grading lymph, beneath which will be found the bare cementum. This sac is rounded in form, and has usually about it a large excavated cavity in the bone, due to absorption both of the maxilla and the fang of the tooth. Sometimes the dilatation and absorption of the bony walls are so great as to form a large cyst in the jaw, which may be diagnosed from a dentigerous cyst proper by the absence of crackling or fluctuation, and from the ordinary tumors of the jaw by its rapid growth and its association with dental caries. Such a cyst would be best cured by laying it open and packing with iodine upon lint.

The ordinary points of exit in an alveolar abscess are, as I have told you, upon the face or gum; but the discharge may dissect down beneath the fascia as far as the larynx or trachea, or even the sternum and clavicle. In fact, I think we have an example of one of these long sinuses in the man whom I now bring before you, and whom I proceed to examine in the same manner as the preceding case. The pus-discharging opening, as you see, is upon the side of the neck, as low as the level of the thyroid cartilage, but posteriorly to the sterno-cleido-mastoid muscle. It is a region well inhabited by lymphatic glands, and such a sinus is not infrequent from them; but as I look into this man's mouth I find a sore and carious second molar tooth upon the left side, and as I pass a probe into the fistule I find that it passes up the neck for a long distance, and directly towards this tooth. The track is too sinuous

to permit complete examination without giving severe pain to the man, and as I am thoroughly satisfied, even from the hasty exploration just made, as to the nature of his trouble, I do not hesitate in pronouncing the diagnosis.

I extract the tooth, and find, as I expected, a large pus-sac at the extremity of its fang. To satisfy all of you of the absolute correctness of my diagnosis, I inject into the alveolus, with a fine-pointed syringe, a solution of permanganate of potash, and, as you watch the lower orifice of the fistule, you will now see the reddened water trickling from it. Nothing certainly could make the correctness of the diagnosis more evident.

The subsequent treatment is but slight, the sinus usually healing without any further attention; but if stimulation is required, an injection of tinct. iodine will usually speedily complete the cure.

I have unfortunately to-day but one other case, which will answer as an illustration of this common, yet frequently overlooked, disease; but those of you who attend upon these clinics during the winter will undoubtedly see many cases, presenting all the varieties and aspects of this affection.

The case to which I allude is this young man, twenty-one years of age, who states that he has been suffering pain in his right lower jaw for several months, and that at last an abscess formed near the angle of the jaw, and has since been constantly discharging pus from its orifice. I look into his mouth, but see no teeth which, at superficial glance, would seem to be the cause of the difficulty; but I do find something else. Behind the second right molar the gum is congested and inflamed, and upon close examination the protruding cusp of a tooth can be seen. The explanation of the abscess is here made plain. An erupting wisdom-tooth fails to find, owing to the shortness of the arch, room for its accommodation, and it has become jammed between the second molar and the ramus. Irritation, pain, inflammation, and abscess are but necessary sequences. Nor are these the only evils arising from the eruption of third molars, trismus, caries, and necrosis being not uncommon; in fact, I think all of you will recall cases which have occurred at this clinic within the past year.

The severity of these results may be estimated when you are informed that death even has occurred in several instances, as in a case recorded by Roberts, "*Conférences de Clinique Chirurgicale*," page 145: Paris, 1860.

For the relief of the man before us there can be but one method, and that is the extraction of the offending cause, since the arch will never be of sufficient length to permit its complete eruption. This done, the sinus will close almost without further treatment.

But the sites mentioned are not the only ones at which an alveolar

abscess may point. It may make its appearance at any point in the hard palate, as shown in a case presented to you a few months since, or it may work up into the maxillary sinus, and thus discharge through its foramen into the middle meatus of the nose, or, becoming encysted, may give rise to bulging of the antral walls, as seen in a case before you last year. (Vide DENTAL COSMOS, August, 1872, p. 439.)

When the superior lateral incisor is in the condition of abscess, it has been found in several instances to discharge its pus even at the posterior extremity of the hard palate, thus giving rise to the suspicion of carious bone,—a point which should always be remembered in diagnosis.

The diagnosis of alveolar abscess from caries and necrosis of the jaw-bone would at first seem somewhat difficult, since both are dependent upon dead tissue, and each have sinuses leading to them. You will find, however, in alveolar abscesses an absence of that dense inflammatory deposit which is so constant around dead bone, while at the same time the sinus will usually be short and single, and the pus which issues therefrom nearly inodorous. In carious bone, the probe can be driven into it, owing to the soft, spongy, honey-combed nature of its tissue.

It is extremely important that a diagnosis be made, since the treatment of the two diseases is radically different. In alveolar abscess, the tooth is to be removed or treated; in caries, we are to expedite the arrest of the morbid process; in necrosis, to delay until separation of the sequestrum occurs.

Surgeons commonly are most liable to err in attributing such a discharge of pus to diseased bone, while dentists may be led to sacrifice teeth when the bone alone is in fault. The result of the mistake of the surgeon is worse, however, than that of the dentist, since by delay permanent deformity of the face frequently occurs.

In some cases it is difficult to discover a tooth which is the cause of an abscess, since the affected organ may not be carious but contain a dead pulp, under which circumstances it becomes peculiarly liable to inflammatory disease. Such a dead tooth does not always show the darkening or discoloration which is ordinarily sought for; but under the rays from a hand-mirror a slight opacity can always be detected, which, together with response to taps of a steel instrument, is sufficient to fix upon any such tooth the cause of a discharging sinus. The practiced eye of a dentist would hardly be apt to overlook such a tooth, but to those of you who are unaccustomed to oral examinations close scrutiny might be necessary; and to you the painful or uncomfortable sensation imparted to a particular tooth upon being struck with a hard instrument would be the first thing to direct your attention to it.

Again, if no opaque, dead, or carious tooth be found in an obscure

case, upon closer examination you may discover an old fang buried away beneath the level of the gum, the removal of which will speedily effect a cure.

But there are still other routes which may be taken by tooth-abscess, for I have known the discharge of pus to appear through the nose,—the true nature of the case not being discovered for a long time, when, upon careful scrutiny, the incisor teeth have been found abscessed.

Again, the pus may seek its outlet alongside of the tooth, or through the pulp-canal, in which latter case the gums may give no evidence of disease,—the discharge even being sometimes so slight as only to be noticed by a foul taste in the mouth. To cure such a case it is rarely found necessary to remove the tooth if it be a permanent one, but the attempt may be made to destroy the pus-secreting tendency of the periodontium by injecting tinct. iodine through the foramen; or by making an incision in the gum over the apex of the fang, breaking through the alveolus with a spear-headed drill, and then injecting freely with iodine, as before. A chronic alveolar abscess can seldom be cured without such counter-opening.

When a tooth is not carious, but is merely opaque from death of the pulp, it need not always be sacrificed, even although the opening of the abscess be upon the integumentary surface, a proceeding such as I have just described being frequently found sufficient to destroy the pus-secreting character of the cyst, and permit a healing of the sinus. When the fistule is upon the gum, as in parulis, the simple enlargement of the sinus, breaking up of the walls of the cyst, and the use of stimulating injections, may quickly complete a cure; but should these temporizing expedients fail, extraction should always be resorted to, particularly if the disease threatens caries or necrosis.

In the case of an alveolar abscess from a carious tooth which has been improperly plugged, the filling should be at once removed, when, if discharge of the pus does not follow, the tooth is to be treated.

Chronic alveolar abscesses are not uncommon to plugged teeth, either from a twist of gold having passed through the foramen, or from the insufficient dressing which has been given to the fillings, thus rendering the tooth the first to be struck by the opposing jaw, and tending to certain irritation. Such malarticulation should always be recognized, and the cause removed by having the filling further dressed down; in fact, in doubtful cases as to the cause, you may be able to derive much light by consultation with an intelligent dentist.

In abscess connected with the temporary teeth, removal should always be immediately practiced, since caries is not an uncommon result of neglect, owing to the non-resisting power of the structure.

Let me then impress upon you, gentlemen, in conclusion, that the great and almost certain means of cure in alveolar abscess is extraction

of the offending cause—the tooth; but yet, as well, that you are to have proper recognition of the value of a tooth, and that such extraction is to be practiced just as limbs are sacrificed,—when we feel and know that we can do nothing better.

I have been speaking to you of alveolar abscess fully formed; but remember that prevention is better than cure,—therefore do not let your cases of periodontitis run on to abscess. Rather combat them in the very inception, the stage of inflammation, when the tooth is becoming sore and elevated in its socket by the swelling of the periodontum. Lance the gums freely, resort to the use of the local antiphlogistic means so familiar to you, and, if not successful, cut at once down upon the apex of the fang of the tooth, thus making an opening through which inflammatory products can escape. This may be done with bistoury or drill, and is among the most certain of all means of abortion. If you are consulted after pus is making its way toward the surface, do not poultice the face, since that will invite the very result which you wish to avoid. Rather apply a roasted fig to the gum, and attempt to produce pointing internally. Failing in this, even if the pus is already thinning the integument, do not give up, but make an opening from within the mouth, and cause the pus to seek that direction by inserting a little tent. Frequently you can thus drain the pus backward, and prevent the deformity of a scar upon the surface. Have in mind the facial artery when you make your puncture, although it is seldom likely to be wounded, since your incisions, whether for the upper or lower jaw, should be directed down upon the bone.

PROCEEDINGS OF DENTAL SOCIETIES.

ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

A MEETING of the society was held at the Philadelphia Dental College, No. 108 N. Tenth Street, on Wednesday evening, December 3d, 1873.

Dr. Amos Wert was unanimously elected an active member.

Dr. S. H. Whitmer, of Newport, Pa., contributed a wisdom-tooth with four fangs, and desired that a record be made in the minutes of the society that he had requested Prof. McQuillen to make a microscopical examination of the specimen of the cemental hypertrophy described in the DENTAL COSMOS, vol. xii. page 225, and then deposit it in the museum of the Philadelphia Dental College, to be used in illustrating the lectures.

Dr. Stellwagen exhibited a molar tooth filled with gold in the year 1834, by Dr. Gunnell, of Washington, showing the filling still intact; he also presented from Dr. Whitney, of Honolulu, some pieces of the

root of a plant growing on the Sandwich Islands, known as "awa," said to have the property, when taken into the mouth, of decreasing the flow of the saliva. It seems, on trial, to act at first as a stimulant to the salivary glands, increasing their action to a marked extent, followed in about five or ten minutes by a reactionary effect, that might be taken advantage of by the dentist, and be of service in performing operations in very wet mouths. He wished the members present to partake of the root, and give their opinions, at the close of the meeting, as to whether the article possessed the virtues claimed for it.

Dr. Marshall H. Webb, of Lancaster, read a paper on "Ruin! Restoration!!" accompanied by two plaster models, one representing the teeth badly decayed and the crowns in a very dilapidated condition, the other showing the most marked change and improvement by the introduction of contour fillings. (See DENTAL COSMOS, February, 1874, page 83.)

Dr. F. M. Dixon expressed himself much pleased with the paper, and moved for a vote of thanks and a copy for publication.

Dr. J. H. McQuillen said it afforded him satisfaction to see such operations so in accordance with his own views. He had over and again on this floor advocated the introduction of contour fillings, not as an extrémist, but only where they were demanded; these days of the abuse of the corundum disk and V-shaped spaces call to mind the practice two generations ago, when the file was depended upon as the principal agent in treating decayed teeth. We all know the reaction following such practice, by the public and the profession, to such an extent that, for a long while afterwards, this valuable instrument had comparatively little to do in the dental operations of the day; and he thought that, in the future, the same result will follow the excessive use of the disk: the popular voice will condemn it. It is one of the most valuable additions recently made to the stock of instruments, but its use should be kept within proper bounds.

Such operations as those exhibited here to-night must exert a most salutary influence upon all present, stimulating to renewed efforts with the determination to maintain an elevated standard in the performance of the daily round of professional duty. Coming, as the essayist does, from an inland city of limited size, such operations indicate that it is not in the metropolitan centers alone that first-class operators are to be found, but that here and there in the small towns and the rural districts of our country may be found men whose skill is such as to induce recognized and leading practitioners to look to their laurels.

Dr. J. H. Githens was much pleased with the work as exhibited in the models; it surpassed anything of the kind he had ever seen. He considers the method of building an artificial tooth on a root by means of gold foil, as practiced by the essayist, to be a great improvement

over the old system of wooden pivots; remembers that, thirty-five years ago, the file was extensively used in the treatment of decay in teeth, and he noticed that in many cases it was followed in a short time by caries at the point filed. He did not approve of anticipating decay by removing substantial and useful portions of the teeth, as experience had taught him the fallacy of it.

Dr. E. H. Neall was exceedingly well pleased, and thoroughly indorsed this practice, as he recognized it as the practice of the future. The time is coming when the public will require such work at the hands of dentists generally.

Dr. W. H. Trueman considered it essential to have every part of his work so shaped as to favor cleanliness, and permit of easy and thorough examination; and for that reason favors V-shaped spaces, and, as a rule, does not attempt to restore teeth to their original shape.

Dr. McDonnell approved of eclectic practice, and endeavored to follow it. He did not like to go to the extreme of either of the two plans spoken of, for the treatment of this class of decay; there are characteristic differences in every case presented, and the treatment for one must be modified to suit another; what would be considered good practice in one case might be very bad in the next. He thought that when we learn to diagnose the proper practice for *each* case, the ratio of success in this extremely difficult class of operations will be greater. In many cases, he thought the V-shaped spaces superior to the contour operations. In those teeth where the structure is dense and the predisposition to decay slight, he would certainly build the tooth out to its original shape; on the other hand, in soft, chalky teeth, apparently under the same influence that interfered, in the first place, with their thorough calcification, he would have no hesitancy in freely using the corundum disk, and making good, self-cleansing spaces between the organs.

Dr. Thomas C. Stellwagen took exception to the extreme contour operations. He preferred a modification of the shape into self-cleansing surfaces. He described the following: A central incisor, much decayed, about two-thirds of the labial plate of enamel involved, and the pulp dead; after cleaning it out thoroughly, and cutting the thin edge of enamel bounding the remaining portion of the tooth, down to a good firm border, he restored what was destroyed by means of a porcelain tooth, ground so as to fit accurately the enamel border and correspond in shape and color to the missing portion of the tooth. It was secured in its place by means of gold screws and oxychloride of zinc.

Dr. Dixon described what he considered a great improvement in pivot operations. It is a method shown to him by Dr. Essig. The root is prepared as usual, with this exception, that the exposed portion of dentine of the root is scraped out and shaped to retain a gold filling that will cover the whole of the exposed end, and thus seal it up

completely. A square tube is then prepared, and inserted into the canal of the root. Gold-foil condensed around it securely holds it in position, while the filling is continued over the end of the root, and finished to conform with the festoon of the gum, in the usual manner. A plate tooth is then selected, of the proper shape and color, backed up and soldered at the desired position to a bar that slides accurately into the tube already built up solidly on the root. He thinks his method the most satisfactory of its kind he has ever seen.

Dr. W. H. Trueman highly approved of the process of inserting pivot teeth mentioned by Dr. Dixon, and described at length in "Harris's Principles and Practice" (edition of 1871, page 516), and credited to Dr. Jas. B. Bean. He had inserted a number very satisfactorily, most of them in roots very much injured by decay; had found them but little changed after years of service.

Bicuspids he had frequently inserted in the same manner, using a flat tube, or by securing a gold wire in the root, and having a tooth carved, with a hole through the center to fit over it, holding it secure by packing gold around the wire. These operations, to be successful, require great accuracy. He always prefers having the tube screwed into the root, if only by a few threads at the bottom; it holds it firmly while packing in the gold.

Dr. M. H. Webb, Lancaster.—This calls to mind a method described by Dr. Wm. H. Dwinelle, of New York, in the April number of the *American Journal of Dental Science*, 1855. He made use of a gold cylinder with a fine thread cut upon the outer surface; into this canula was inserted a gold pivot. Trimming away the exposed dentine of the root, which is often considerably affected by caries, to the cementum, and placing the cylinder in position, he filled over the remaining dentine with gold, thus protecting it from a recurrence of decay. The margin of cementum is then alone exposed, and this, being highly organized, so far resists the action of destructive agents that, while yet vital, it does not yield to their influence. However, when the supporting dentine is gone, the thin walls are broken down by mechanical means, and in this way destroyed.

Dr. Robt. Arthur's idea, in this connection, is a very good one. An ordinary pivot crown is made, into which is fixed a platinum cylinder; into this cylinder, or canula, thus moulded within, and permanently retained by the fused tooth-body, is soldered a gold pivot. The porcelain crown is then ready, after, perhaps, some further adaptation, to be placed in position, where it is retained by means of Hill's Stopping, which, when made plastic upon the insertion of the somewhat heated pivot and crown, fills up the spaces where the gold does not come in contact with the remaining dentine, or the porcelain with the margin of cementum.

E. L. HEWITT, *Secretary*.

ANNUAL MEETING OF THE EAST TENNESSEE DENTAL ASSOCIATION.

THE seventh annual convocation of this body was held at Knoxville, Tenn., October 15th, 1873. President, W. H. Cooke.

Dr. Harris, of Knoxville, was admitted as a member.

Dr. W. C. P. Jones, of Madisonville, Tenn., was expelled for unprofessional conduct.

Officers for the ensuing year were elected as follows:

President.—W. F. Fowler, of Greenville, Tenn.

Vice-President.—J. D. Morgan, of Smith's Cross-Roads, Tenn.

Corresponding Secretary.—J. H. Lincoln, of Chattanooga, Tenn.

Recording Secretary and Treasurer.—S. M. Prothro, of Chattanooga, Tenn.

The following resolution was unanimously adopted:

Resolved, That the Chair appoint a committee of three, which shall constitute an Examining Committee.

Resolved, That for mutual improvement, and as an incentive to the junior members to apply themselves to the study of their profession, the chairman assign each member of this association some subject pertaining to dentistry, upon which he is expected to inform himself by the next annual meeting, and in presence of the association be examined by the Examining Committee.

In accordance with the above, Human Anatomy was given as the subject for examination at the next annual meeting.

Adjourned to meet at Cleveland, Tenn., on the third Wednesday in April next, in special session.

S. M. PROTHRO, *Secretary*.

MISSISSIPPI VALLEY AND MISSOURI STATE DENTAL ASSOCIATIONS.

A JOINT meeting of the above associations will be held in Polytechnic Hall, St. Louis, Mo., March 3d, 4th, 5th, 6th and 7th, 1874.

The Missouri State Dental Association will convene on Tuesday, March 3d, at 2½ P.M.

The thirtieth annual meeting of the Mississippi Valley Dental Association will convene on Wednesday, March 4th, at 10 A.M.

Subsequent sessions will be arranged to subserve the mutual interests of both associations.

CENTRAL ILLINOIS DENTAL SOCIETY.

THE call for the organization of this society which appeared in the January DENTAL COSMOS, should have been in behalf of a committee. The individual signature of John M. Hurtt was an inadvertence, owing to the letter requesting the publication of the call having been written by him.

EDITORIAL.

MALPRACTICE.

IN medicine and surgery, practice whereby a patient suffers unnecessarily the loss of life, limb, sight or hearing has been held to be malpractice, if the fact were proven that the treatment was at variance with established rules or principles, either from ignorance or carelessness on the part of the practitioner.

Physicians and surgeons have been mulcted in heavy damages because a jury were of opinion that a shortened limb, a stiff joint, a crippled hand or a defective eye were the result of incompetency or neglect of the medical attendant; and, where the evidence clearly shows that the disability is the consequence either of ignorance of well-defined rules or of criminal disregard of them, the community indorses the verdict which compels the pretender or the unworthy to suffer in his pocket as a compensation, so far as may be, for the needless suffering or damage resulting. In other words, society demands (but not so sternly as it should) evidence not only of reasonable effort and care on the part of a physician or surgeon, but evidence also that he is familiar with the literature of the subject involved, and that, if differing from recognized authorities, he does so on the basis either of experience or of intelligent theory.

To apply these principles of judgment to the practice of dentistry would not only be disastrous to the fame of many in the profession, but if the community were educated to the proper appreciation of the value of a tooth, suits at law for malpractice in dentistry would result in damages which would do much toward ELEVATING THE PROFESSION. It is high time that certain operations and practices should be abandoned: such as the premature extraction of the deciduous teeth, causing irregularity of the permanent set; the treatment of sensitive dentine with arsenic, resulting in dead pulps and discolored teeth; the rash extraction of lateral or cuspid teeth to correct irregularity; the sacrifice of sound and useful teeth to make uniform substitutes practicable; the administration of anæsthetics in ignorance of their properties and of the treatment of threatening conditions resulting. It is high time that operations like these should be declared malpractice, and that such exemplary damages should be awarded as would teach their authors that which they have failed otherwise to learn.

We have some sympathy for a physician who fails to recognize an erupting wisdom-tooth as the cause of tetanus; who treats as ozæna the discharge resulting from a dead tooth; who overlooks dental lesions as factors in neuralgic and ocular affections; who resorts to the external treatment of alveolar abscess, producing disfiguring scar or

fistula ; who cannot tell except by hypertrophy of the gum what tooth is likely to be the cause of the irritation in primary dentition. Knowledge of such matters has not been considered essential by many physicians, and, considering the immense variety of pathological conditions to which the attention of general practitioners is invited, it is not so much to be wondered at if they admit or demonstrate by failure the want of the special knowledge or skill required. But that one who, devoting himself to a specialty, thus inviting confidence as to special fitness, should display such ignorance or indifference as is manifested in many cases coming under our observation, shows the necessity for the application of some enlightening influence ; and we can conceive of no surer means of bringing such men to a realization of their responsibilities than an award of damages proportionate to the mischief.

What will compensate a lady for a discolored central or a fistulous opening on her cheek or chin ? We suggest that one thousand dollars would be poor compensation for the loss of a central incisor ; but the operator, who, through fear of losing popularity with a fair patient by inflicting a little pain, resorted to arsenic to lessen sensitiveness and so caused death of the pulp and consequent discoloration of the tooth, would probably change his opinion of the method if compelled to pay that amount in damages.

Let us have the value of a tooth determined by jury-trial.

BIBLIOGRAPHICAL.

A DICTIONARY OF MEDICAL SCIENCE. Containing a concise explanation of the various subjects and terms of Anatomy, Physiology, Pathology, Hygiene, Therapeutics, Medical Chemistry, Pharmacy, Pharmacology, Surgery, Obstetrics, Medical Jurisprudence and Dentistry ; Notices of Climate and of Mineral Waters ; Formulæ for Official, Empirical and Dietetic Preparations ; with the Accentuation and Etymology of the Terms, and the French and other Synonyms. By ROBLEY DUNGLISON, M.D., L.L.D., etc. A new edition, enlarged and thoroughly revised by RICHARD J. DUNGLISON, M.D. Philadelphia : Henry C. Lea, 1874.

In these days of book-making, when volumes spring up like Jonah's gourd, to endure about as long, it does one good to see such a work as that which is now before us. It is pleasant to think of the cordial reception which it is sure to have ; of the respect and confidence it will command ; of the goodly fellowship of students and workers to which it will be admitted, and of its assured longevity.

There is something very nearly akin to moral heroism in the patience and fidelity shown in the preparation of this volume. Two things,

apparently incompatible, have been achieved by the author,—thoroughness of treatment and vigorous condensation. To approximate the result indicated by the title-page, it may well be conceived was no easy task; but the ambition which dictated it did not exceed the ability displayed in every page which follows; and it must be admitted that the field marked out is fairly occupied. There can be no controversy about the position which this book deserves,—the clear method, the breadth of learning, and the fullness of treatment manifested throughout its more than eleven hundred pages, lifting it above all rivalry, and making it indispensable to every student of medicine.

It is not necessary to occupy space in a detailed account of its merits. Suffice it to say that the present edition includes more than *six thousand* subjects and terms not embraced in the last, and contains additional matter equivalent to one hundred and sixty pages.

Every scientific library must remain incomplete, lacking the *new edition* of DUNGLISON'S DICTIONARY.

OBITUARY.

SAXON P. MARTIN, M.D., D.D.S.

DIED at McDonough, New York, December 28th, 1873, of consumption, Dr. S. P. Martin, aged 49 years.

He studied medicine and graduated in 1849, and practised as a physician for about thirteen years; was elected to the legislature of New York in 1862, and soon after commenced the study of dentistry, graduating at the Philadelphia Dental College in 1865.

Dr. Martin bore the reputation of being a skillful physician, an excellent dentist, and a gentleman in all the relations of life.

PERISCOPE.

ART AND SCIENCE.—Art may be, therefore, either empirical or scientific—that is, based upon experiment and observation, or upon scientific discoveries. In the beginning of things there were no discoveries, for there was no science to make them. The mind of man could only invent from such materials as it had, and these materials were but scanty. But as man progressed in civilization, inventions grew to be less and less based upon empiricism, and more and more based upon science; and of all the great inventions of to-day, it is probably not too much to assert that nearly all of them will be found to be mediately—if not immediately—derived from scientific sources. In fact, art precedes science, for, as Spencer has well said, “It results from the necessity we are under of reaching the abstract by way of the concrete, that there must be practice, and an accruing experience, with its empirical generalizations, before there can be science.”

But science pays her indebtedness to art with compound interest, by immensely enlarging the field of invention, and investing its products with a certainty that could not otherwise exist. For the art founded upon empiricism can never equal in accuracy that founded upon science. In the former we are compelled to rely upon rules unmeasured by an unimpeachable standard. There never can be any certainty that we are right. Our work, when done empirically, lacks evenness, and, besides, does not possess the element of permanence. And so we flounder on, when immersed in the swamps of empiricism, groping we know not whither, and yearning for the spiritual illumination of science which shall light us to dry ground.—*Edward B. Taylor, in Pacific Med. and Surg. Journal.*

CLAIMS OF MEDICINE TO BE REGARDED AS A SCIENCE.—Gentlemen, I have alluded to the right which our profession has to be considered a science, as contra-distinguished from an art. Allow me to make an observation or two on this point. An art, as I understand it, is a pursuit more or less of a mechanical character, which is regulated by fixed rules, these rules themselves being often arbitrary in their nature, and having nothing to determine their fitness but the capricious authority that regulates their proceedings. Now, the practice of medicine when rightly understood, and when pursued in a proper spirit, is the very opposite of all this. It is based upon the perpetual exercise of the reasoning powers brought directly to bear upon the individual instance before us; and because of the ever-varying nature of the symptoms of disease and the diversities of the human constitution, this principle is lost sight of the moment the practitioner, leaving out of view the personal peculiarities of his patient, proceeds to treat him in a blind routine manner. That moment he abnegates his high function, and proclaims that he is no longer fit to be trusted with the solemn responsibilities he has undertaken. But there are differences to be observed affecting the same individual at different times, which indicate variations of intensity in the vital forces depending altogether on extraneous influences, and which cannot properly be set down as due to changes in the organization, for this simple reason, that they are observed to appear and disappear in intervals of time too short to allow of such organic changes being produced. Every one feels the debilitating effects of a close and sultry day, when the atmosphere is heavy and the air oppressive; and, on the contrary, we all experience a buoyancy of spirits and a lightness of step when the weather is cold and bracing; and if this is true as regards the strong, the healthy, and the robust, it is still more obvious in persons who are delicate, and in those who are infirm or afflicted with chronic ailments.—*Abstract of an Address by James Foulis Duncan, M.D.*

THE CONSTITUTIONAL RELATIONS OF SECOND DENTITION (*New York Medical Journal*, January, 1874).—Dr. Joseph Mulreany, in an extremely interesting paper, records a number of cases occurring in his practice, and illustrating some practical points connected with the protrusion or cutting of the permanent teeth, especially the first four molars and the four wisdom or third molars. He believes that the physiological irritation of a new tooth cutting through the gum is the direct, though frequently unsuspected, cause of many diseases, both of childhood and maturity, and that the results of treatment demonstrate

conclusively that such is the case. He says that every case of true morbus coxarius he has met with began between the fifth and seventh year, or it might be a few months earlier, and also whatever mischief occurred to the joints took place during the cutting of the first four molars of the permanent teeth, and that after they had come fairly through the process of separation commenced. His illustrations are numerous, the more important ones being as follows:

Case I.—Miss W., when a child of between five and six years, suffered from morbus coxarius. The first indications of the joint-disease were lameness and pain when the head of the femur was strongly pressed against the acetabulum. In process of time the usual symptoms of pain in the knee, flattening of the hip, and shortening of the limb, took place, but all in a mild form, and all subsided at the end of her sixth year, coincident with the complete protrusion of her first four molar teeth, leaving her slightly lame for life. She was a member of a family of a highly scrofulous diathesis.

Case II.—Margaret McC., aged $6\frac{1}{2}$ years; had had pain in the left hip-joint and knee for over a year; slightly lame; hip flattened; right upper molar still to be protruded. The gum was well scarified, and she was ordered iodide of iron with senna as an aperient,—the gum to be scarified once a week until the tooth came fairly through. In a month she was greatly improved.

Case III.—C. D., æt. 20 months; had enlarged and suppurating cervical glands, but was in good condition. About the twenty-fourth month he had cut all his deciduous teeth, and every bad symptom disappeared. In his fifth year he was suddenly seized with pains in his left hip. He was ordered an effervescing mixture containing iron and iodide of potassium, and a small blister was applied from time to time over the hip-joint. The gums were not scarified, owing to the violence of the patient. This condition continued for a year and a half; sometimes he could walk without the aid of a crutch, but invariably, when he had a teething-spell, he was forced to crawl about on all-fours. At this time a surgeon, who was called in consultation, diagnosed such an amount of disease as to warrant immediate resection of the hip-joint, though Dr. Mulreany was convinced that it was a case of morbus coxarius brought into action by dental irritation. An amputation of the head of the femur was attempted, but a deep and ample incision down to the capsular ligament assured the operator that the joint was too sound to justify him in cutting into it. The operation was abandoned; but the final issue of the case is not stated.

Case IV.—A boy, æt. 6 years, was seen in consultation. His physician stated that for six weeks the boy had had a kind of remittent fever, worse at night, with obstinate constipation. On examination, it was found that the first four molars were pressing against the gums, causing much tension, and that there had been epistaxis. A few days later, the child growing worse, the gums were scarified, a laxative mixture was given, and in two days the attack was concluded.

An important medico-legal point sometimes arises between the eighth and fifteenth year, the inflamed condition of the gums over the bicuspids often giving rise to a purulent discharge from the vagina. The English law treats all illicit sexual intercourse with females under sixteen years of age as rape, and too often such discharges have been received as testimony of the fact.

Of the phenomena associated with dentition between the seventh and fifteenth year, scrofula of the bones, nocturnal incontinence of urine, chorea, and heart-affections are the most common.

Now in regard to the wisdom-teeth:

Case VII.—Mr. V., æt. 23, subject to violent bilious attacks, low-spirited, sleepless, constipated, frequent epistaxis, pain in articulations of lower jaw. None of the wisdom-teeth through. His gums were scarified, and he was ordered to do the same frequently, and to take a little tincture of iron and an infusion of senna. Cured.

Case VIII.—Miss A. D., æt. 18; tall, fair, anæmic, cardiac bruit, violent headaches, profuse epistaxis, irregular menstruation; wisdom-teeth not quite through. Her gums were thoroughly scarified frequently, and quinia and tincture of iron, with senna as an aperient, were given. Cured.

Case IX.—Miss B., æt. 20; profuse epistaxis, preceded by jaw-ache, approaching phthisis of right lung, quick pulse, loud anæmic cardiac bruit, amenorrhœa, frequent micturition, constipation. Wisdom-teeth had not shown themselves. Her gums were scarified, and she was ordered quinia, iodide of iron, and tincture of digitalis.

Case X.—Miss S., æt. 17; pale and exsanguineous, palpitations of the heart, headaches, constipated bowels, menorrhagia, coated tongue, chlorotic bruit. She had lost great quantities of blood, owing to nervous obstruction at the center of the circulation, caused by dental irritation from the wisdom-teeth acting directly on the heart. Scarifications, iron, and digitalis effected a speedy and perfect cure.

Case XI.—Mrs. J. M. S., æt. 19; married six months, during which time she has had a colored discharge from the vagina. None of the wisdom-teeth present. Scarifications and tincture of iron gave the happiest results.

Dr. Mulreany proceeds to state that dental irritation may be the cause of dropsical effusions, both in the chest and abdomen, of heart-affections, of hysterical troubles of the joints, of masturbation, and of sterility and miscarriage, and gives cases in support of his views; but he asks that the physiological irritation of which he speaks shall not be confounded with the pathological irritation of an old, decayed, and carious tooth producing periostitis and gum-boil.—*Philadelphia Medical Times.*

NEURALGIA CAUSED BY GRANULES OF OSTEO-DENTINE.—This is a very obscure disease and difficult to diagnose, owing to the absence of external signs, which might at all times indicate the presence of granules in the pulp. The following four cases have come under my treatment since last September, and, thinking that a short and even imperfect history may be interesting to many readers of the *Register*, I have been induced to send it for publication. The first case, that of a lady, Mrs. R., æt. 30, who had suffered more or less at intervals for about a year, was treated by a physician for idiopathic neuralgia, without any benefit, he being unable to discover any cause. Pain was confined to left side of face and head, with occasional darting pain in the neck, shoulder and arm. Examined all the teeth on the left side carefully, also on right side. Many of the teeth contained small cavities, nerves not exposed. Tapped each tooth with an instrument, and patient experienced, as she said, a "curious" feeling in left superior second

molar. With small drill entered through cavity of decay into pulp-chamber; patient experienced but little pain. Enlarged opening, and with fine-pointed instrument made examination to discover the little bundle of semi-bone-like material in pulp-cavity. Removed it, and the patient has not had a symptom of pain since, now over two months ago.

The second case, that of a man, Mr. S., æt. 27; had pain for long time in side of face and head, and at times patient stated all the teeth on the right side seemed to ache; wanted some of his teeth pulled right out; supposed that some one of the teeth on right side was the cause of the trouble; most all were filled with gold or amalgam, and were sensitive to a jet of cold water thrown from a syringe, except second superior molar on right side, which contained an amalgam filling. Removed filling and found floor of cavity solid and not in the least sensitive; drilled into pulp-cavity, and applied creasote. Patient said he was relieved; returned next day, had suffered all the previous night; pain worse than ever, recurring at shorter intervals during day. Proceeded to open the tooth at once, and found "granules" occupying almost entire pulp-cavity. This was a beautiful specimen; six or eight little, almost transparent balls, all compacted, and apparently as hard as glass. The patient experienced some pain during the removal, but has had no return of the disease since.

The third case, that of a lady who, as she told me, had pain in her jaw and face for several weeks. Her medical adviser failed to give relief; I at the first sitting decided which tooth caused the trouble, and diagnosed granules in pulp-cavity; there was small cavity in the tooth, and very sensitive nerve not exposed; applied arsenic and dismissed patient. Next day removed the largest specimen of granules that I have ever seen. They appeared united, but by rolling between thumb and finger the little nodules separated, and under a magnifying-glass were as round as shot, perfectly smooth, and of a clear amber color. The lady has been free from neuralgia since that time.

The last case, a man came to me complaining about as the other patients; could not localize the pain, was much worse at night, about three attacks during the day; came to my office four times before I decided which tooth, if any, caused the mischief, when I finally removed the amalgam filling from second left superior molar; endeavored to drill into pulp-cavity, but after a few turns of drill found the tooth so exceedingly sensitive that I applied paste, which I let remain twenty-four hours, when I had no trouble in opening pulp-chamber, and extracted therefrom a small bundle of granules. There was very little nerve or pulp except in palatal root; no pain since.—A. Miller, in *Dental Register*.

PARALYSIS OF THE THREE BRANCHES OF THE TRIFACIAL NERVE.—Dr. A. Seeligmüller refers to the case of a woman aged 26, in whom neuro-paralytic inflammation of the eye set in after nearly three years of anæsthesia of the left side of the face (this was at first limited to the left corner of the mouth, from which it afterwards spread upwards). The left half of the tongue was thickly coated with a white fur; the right was of a bright-red color; taste was lost in the anterior two-thirds of the left side of the tongue. A two months' course of treatment with the constant electric current (the positive pole being applied

behind the left ear, and the negative to the face) produced marked improvement in all the symptoms.—*Philadelphia Medical Times*.

TREATMENT OF MORBID DENTITION.—I had occasion last January to prescribe for the patient of another physician, a boy æt one year, suffering from derangement of the stomach and bowels while teething. His stomach was very irritable, bowels moving frequently; head hot, and temper fretful; he had some fever, but temperature not remembered. He had been taking for several days a mixture of paregoric, lime-water, and milk, without any permanent benefit. Ordered—

R.—Pot. bromidi pulv., grs. xv;
Pot. nit. pulv., grs. xij;
Zinci oxidi, grs. ij. M.

Divide in chart No. vi. S. one powder every four hours until bedtime.

Added nit. pot. on account of the fever. In twenty-four hours he was greatly improved; stomach and bowels quiet, fever abated, and temper playful; continued brom. pot. and zinc, leaving off the nitrate pot., and he had no further trouble. At the next eruption of teeth he had the same symptoms, which yielded readily to the same prescription without any special treatment directed to the alimentary canal, the vomiting and purging being restrained by quieting the nervous irritability,—in other words, removing the cause. The above treatment is based on the idea that the anorexia, vomiting, and purging are reflex symptoms dependent on irritability of the nerve-centers, which, unchecked, is liable to eventuate in convulsions, congestion or inflammation of the brain, or inanition from derangement of the digestive function.

In my opinion, the treatment is safe, and can be kept up some time, and is really more valuable in the prevention than the cure of bad symptoms. I have not used this treatment extensively, but am pleased with it thus far, and emboldened to ask a trial of it in this disease in the way of prophylaxis and cure. The oxide of zinc is combined in the above from its supposed sedative effects, and I should think that a definite compound of bromine and zinc would be useful and convenient in various nervous affections. The "child of the period" is an interesting study, and needs attention as well as the girls and boys of the period. Begotten of nervous parents, he has a double inheritance of nervous predisposition, with a lack of physical development in other respects.—*E. D. Drake, M.D., in Medical and Surgical Reporter*.

THE USE OF THE GUM-LANCET.—*Messrs. Editors*,—Your ingenious correspondent, "Gum-Lancet," in the *Journal* of the 13th ult., asks for information on the subject of lancing gums.

1st. "Who cuts gums?" The present writer, with a respectable number of brother physicians, both at home and abroad.

2d. "Why does he do it?" On the same principle that a surgeon cuts for a bullet, a splinter, a piece of dead bone, a collection of pus, or any other foreign body or substance imbedded in the tissues and tending to keep up inflammation and constitutional disturbance. The tooth to all intents is a foreign body, whose effort to work its way through the gum causes local inflammation, sympathetic fever, and extreme nervous irritation, so distressing and so dangerous in a young child. It is a common belief that teething causes convulsions; why not, if the fever

runs high enough, as well as any form of fever in childhood? I am sure I have seen such cases. What is the natural indication? To make a free opening for the escaping tooth, thereby abolishing the local irritation and with it the attendant train of constitutional symptoms. *A fortiori*, if the child is suffering at the same time from any other disease, might the operation be done as a means of diminishing every extraneous source of irritation.

3d. "Will any one give us his personal experience of its advantages over the let-alone system, if it has any, and oblige, &c.?" As to any one having a "*system*" for lancing gums simply because a child happens to be teething, nothing could be more absurd. If there is no trouble, let him alone by all means. If, on the other hand, the gum is inflamed, with an undue amount of constitutional sympathy, I have often found it useful to cut it. Among the good effects I have witnessed are a diminution of heat, fever, pain and nervous irritability, with a more rapid extrusion of the offending tooth; in complicated cases, the relief of convulsions and the alleviation of various acute diseases, especially those of the stomach and bowels. In many cases no benefit whatever is experienced, but I never knew or heard of its doing harm in a single case.

Thanking your correspondent for the pleasurable opportunity thus afforded of obliging him, I remain, yours sincerely, *E. T. W.*, in *Boston Medical and Surgical Journal*.

WHEN TO LANCE THE GUMS.—Dr. J. L. Smith says, in his late work on "Diseases of Infancy and Childhood:" "The gum-lancet is now much less frequently employed than formerly. It is used more by the ignorant practitioner, who is deficient in the ability to diagnose obscure diseases, than by one of intelligence, who can discern more clearly the true pathological state. Its use is more frequent in some countries, as England, under the teaching of great names, than in others, as France, where the highest authorities, as Rilliet and Barthez, discountenance it.

"It is well to bear in mind, as aiding in the elucidation of this subject, the remark made by Trousseau, that the tooth is not released by lancing the gum over the advancing crown. The gum is not rendered tense by pressure of the tooth, as many seem to think, for, if so, the incision would not remain linear, and the edges of the wound would not unite, as they ordinarily do by first intention within a day or two. This speedy healing of the incision, unless the tooth is on the point of protruding, is an important fact, for it shows that the effect of the scarification can only last one or two days. The early repair of the dental follicle is probably conservative so far as the development of the tooth is concerned. It may help us to understand how active, how powerful the process of absorption is, if we reflect that the roots of the deciduous teeth are more or less absorbed by the advancing second set, without much pain or suffering from the pressure. If the calcareous particles of the teeth are so readily absorbed, what is the foundation for the belief that the fleshy substance of the gum is absorbed with such difficulty? Too much importance has evidently been attached to the supposed tension and resistance of the gum in the process of dentition.

"Follicles in the period of development are especially liable to in-

flammation. We see this in the follicular stomatitis and enteritis so common when the buccal and intestinal follicles are in the state of most rapid growth. Does not this law in reference to the follicles hold true of those by which the teeth are formed, so that the period of their enlargement and greatest activity, which corresponds with the growth and protrusion of the teeth, is also the period when they are most liable to congestion and inflammation? This fact affords a better explanation of the frequency of the so-called laborious or difficult dentition than that it is due to the resistance which dental evolution encounters from the gums.

"If there are no symptoms except such as occur directly from the swelling and congestion of the gum, the lancet should seldom be used. The pathological state of the gum which would, without doubt, require its use, is an abscess over the tooth. As to symptoms which are general or referable to other organs, as fever and diarrhoea, the lancet should not be used if the symptoms can be controlled by other safe measures. All co-operating causes should first be removed, when, in a large proportion of cases, the patient will experience such relief that scarification can be deferred.

"If the state of the infant is such that life is in danger, as in convulsions, or there is danger that the infant will be permanently injured or disabled, as by paralysis, every measure which can possibly give relief should be employed without delay. In these dangerous nervous affections, therefore, the gums, if swollen, should be lanced. I know no accidents of dentition which require prompt scarification except suppurative inflammation of the gums, convulsions, and paralysis. In other cases the operation may be safely postponed till other measures have been employed."—*Medical and Surgical Reporter*.

DIGESTIVE POWER OF SALIVA AND PANCREATIC JUICE DURING INFANCY.—The recent experiments of Korowin, of St. Petersburg, upon the saliva of newly-born infants and sucklings, in regard to the time of its very earliest appearance, and its fermentative power at different ages, will deserve the careful attention of all interested in the dietetics of children. Korowin (*Centralblatt*, 1873, Nos. 17 and 20) adopted the plan of giving to infants pieces of compressed sponge to suck, and then squeezing from these whatever saliva, if any, might be collected. In this way he was able to determine that saliva may be obtained from the mouth of a child only a few moments born. The secretion is, however, very scanty; indeed, during the first two months of life collecting the saliva is a most difficult process, and demands great perseverance, not more than one cubic centimetre being obtained at one time (fifteen to thirty minutes) in any experiment. From the end of the first month of life, and especially after the sixth week, the amount of saliva which may be removed increases much. In the third month as much may be obtained as in the first month in one-tenth the time. In the fourth month one to one and a half cubic centimetres can be collected in from five to seven minutes, and it is at this age that the saliva begins to flow visibly from the mouth of the child.

The saliva of the child possesses its diastatic or fermentative property from the time of its appearance—that is, immediately after birth. The action of the saliva, however, is not always equally powerful; on the contrary, it increases steadily and rapidly with age up to a certain

point, as Korowin was able to determine by watching children for months. It seems certain that while the diastatic power of saliva increases up to the eleventh month of age, it then reaches its maximum,—that is, a given amount of saliva of a child of eleven months and of an adult respectively, decomposes equal quantities of starch-paste.

Korowin has also turned his attention to the pancreas and its secretion in newly-born children and in sucklings. The pancreas was removed from the bodies of children who had died of various diseases, at various intervals post-mortem. An artificial pancreatic juice was then prepared in the usual manner, and the amount of glucose formed estimated quantitatively. The results obtained are very important. In a child of one month the action of pancreatic juice upon starch is absolutely *nil*; it is first demonstrable in the second month, but very feeble; at the end of the third month of life it has become sufficiently powerful to make a quantitative estimation possible of the sugar formed. The diastatic action of the pancreatic juice, once acquired, steadily increases in intensity with age, and reaches its maximum at the end of the first year of life.—*Medical Times and Gazette*.

JACOBI'S FOOD FOR CHILDREN.—This is prepared as follows: Crack a teaspoonful of barley in a common coffee-mill, then boil it fifteen minutes in a gill of water, adding a pinch of salt. Then strain, and for a young child add one-half as much cow's milk as you have barley-water, and, whilst tepid, nurse from a nursing-bottle. Sweeten lightly with sugar. If the bowels are costive, use oatmeal in place of barley. Keep the bottle clean.—*Philadelphia Medical Times*.

TREATMENT OF HEMORRHAGE FROM EXTRACTION OF TEETH—The following are the conclusions of a very complete essay published on the above by Dr. Joseph Moreau, in the last number of the *Archives Médicales*: (1) Hemorrhage in such cases is an accident ordinarily benign, but which should always engage the attention of the surgeon through the exceptional gravity which it sometimes presents. (2) As it takes its intensity from individual conditions or constitutional affections, the surgeon must consult the history of the patient and be mindful of the signs of hæmophilia. (3) When this predisposition to hemorrhage exists, he must absolutely refuse to perform the extraction. (4) In cases where the hemorrhage does occur, the surgeon must empty the alveola of any foreign bodies, reduce the displaced osseous parts, resect any loose flaps of gum, or put them back into their places according to their extent, cause the patient to wash the mouth gently and repeatedly, and forbid all movements of suction. (5) Should the hemorrhage persist, he must plug the alveola by means of a substance impervious to saliva, and make use of a contrivance for compressing the gum similar to the one described in this article.—*The Lancet*.

TREATMENT OF EXPOSED PULP.—It sometimes will happen that after the pulp has been dressed and the tooth stopped in an apparently satisfactory manner, acute pain comes on within two or three days, with great tenderness on percussion, some swelling of face or gums,—in fact, all the symptoms of commencing inflammation of the alveolar periosteum. It is at this stage that treatment must be undertaken if any good is intended to be done, for if the inflammation has proceeded so far as to produce abscess, there is nothing for it but to drill through or with-

draw the stopping, or, it may be, to extract the tooth. Within the last six months there have been two of my cases in which the above symptoms appeared: in the first case the pain commenced on the second day, in the second case on the sixth day after stopping; so it will be seen that they were genuine cases of commencing alveolar abscess, and not due to the Fletcher's enamel, which often causes pain for two or three hours after its insertion into the cavity, even when the pulp is not exposed.

In the first case, it appeared to me that if the chloride of ammonium relieved the pain in certain cases of toothache, as I described in the February number of this *Review*, and allays inflammation in fibrous tissues like the sclerotic coat of the eyeball, as has been proved by the Germans, I considered it would be quite legitimate to prescribe it before adopting any other proceedings. This I did, and was much gratified to find that the pain, etc., was relieved within forty-eight hours, leaving only slight tenderness on percussion and during mastication; this also passed off in a few days. It is now six months since these symptoms occurred, and there has been no return of them.

In the second case, the symptoms did not make their appearance, as I have said, till the sixth day after stopping, and were caused probably by exposure to cold and want of nourishment, for the patient had been fasting for a long period, and had been industriously visiting among the poor. The toothache was accompanied with a good deal of feverishness, headache, languor, and slight sickness. I did not see him till the evening of the eighth day (Saturday), and then ordered him a warm bath, some beef-tea, and five grains of quiniæ sulph. at bedtime, and the chloride of ammonia three times a day. On the Sunday the pain was considerably abated and the feverishness had disappeared, and by Tuesday the patient was better. One month has since elapsed without any return of the toothache.

I have notes of twelve cases of exposed pulp in which I pursued the above plan of stopping during the last six months. The two recorded above were the only cases in which unfavorable symptoms arose, and these were, I believe, cured by the early administration of the chloride of ammonium. I am well aware that the above cases are not of themselves numerous enough to be of much weight, but I have recorded them, as I consider this plan of treatment to be worthy of a more extended trial, and shall be very glad if other dentists will pursue it and publish their experience, whether favorable or otherwise.—*W. J. Barakas, M.R.C.S.E., in Monthly Review of Dental Surgery.*

OXYCHLORIDE OF ZINC FILLINGS.—Before mentioning the various cases in which oxychloride might be employed with advantage as a filling, I should like to utter a warning note for the benefit of those who begin to use this filling for their patients' good, and end by using it simply for their own convenience and to save themselves trouble. They are in a hurry; the cavity is difficult to get at; a gold filling may not succeed; the tooth is tender too, and the patient does not like pain, so a plastic filling is introduced. Such get into the habit of using it for all difficult cavities, and reserve the gold for the simpler ones; and thus our skill in gold filling never attains perfection, and we have as a consequence many of our countrymen and women actually refusing to consult any but American dentists.

I should like to offer, as an example for us all to follow, that of one of our leading dentists, who, having twice filled a tooth with gold unsuccessfully, still persevered a third time, almost in opposition to his patient's wishes, and finally succeeded in placing a good gold filling in a very difficult cavity. No doubt he lost in a pecuniary sense, for patients were always waiting his pleasure, but the gain to the profession was worth more than the loss of fees.

Osteoplastic fillings may be legitimately used for cavities of large size with exceedingly papery high walls, where it is not advisable to use amalgam, and where you do not wish to cut the wall down; also for cavities where only one high wall remains, the others having broken away; an example of this you frequently get in bicuspid teeth. Also to fill tender and sensitive milk-teeth, where you have no reason to suppose that the pulp is seriously affected. It may be used to fill up the lower portion of very deep cavities, such as you sometimes get on the masticating surfaces of molar teeth; in these cases the gold is economized and the pulp protected. But the two most important instances in which the oxychloride may be used are for capping exposed, or very thinly covered pulps; and for filling the pulp-cavity and canals of dead teeth.

Oxychloride of zinc should never be used in proximal or buccal cavities if it is possible to avoid it; neither should it be employed in those cases where the inflammation of the pulp has gone on to suppuration, or to partial or complete devitalization; in such cases the pulp-chamber should be at once opened, arsenious acid applied, and the pulp extracted; and I here allow myself to remark, that in my own experience, where I have hesitated to adopt this summary mode of treatment, and have tried to preserve the pulp, to save the patient and myself the inconvenience and pain of extirpating it, I have always found it to be the exception when success has attended my efforts; and even in the successful cases, when periods of extreme depression of vital powers have occurred, such as the later periods of gestation, the period of suckling, and after exhausting diseases, that particular tooth has begun to give trouble, whereas in those cases where the pulp is removed and the pulp-chamber and canals well filled, any result short of a complete success is almost impossible.—*John Fairbank, M.R.C.S., in British Journal of Medical Science.*

PIVOT CROWNS.—Artificial crowns are attached to natural roots better by means of rubber than wooden pins, using the ordinary plain rubber-plate teeth. We thus find relief from many of the perplexities incident to the more common custom of wooden pivots and pivot crowns.

The end of the root is cut in proper shape. An aperture is cut, having reference only to strength, making the hole a little larger than if a wooden pivot was to be used. A long pivot is now made to fit the hole loosely; when in position an impression of the parts is taken, the long pivot being brought away with the impression, which is now varnished and a model poured.

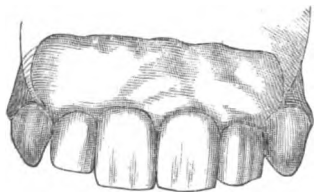
After parting impression and model, we find a corresponding aperture in the model to the one in the natural root. The aperture in the model is enlarged one-third or one-half, and a gold wire, about No. 24 size, and 18 carats fine, after being roughened on its surface, is driven

into the center of the extremity of the aperture and caused to occupy a parallel, central position. The crown that had been selected is now carefully adjusted, the gold wire cut off at a point indicated by the pins of the crown, which is now secured by means of wax, shaped as the rubber is desired to be. Invest the case in one section of the flask, submerging the whole in plaster except the wax, which is left exposed; when the entire flask has been filled and parted, the wax can best be removed without injury to the parts by pouring on the point at some little distance a small stream of boiling water which carries away the wax readily and leaves the parts clean. Now pack with small particles of black rubber, being very careful not to break off and carry into the orifice pieces of plaster, producing the double evil of defacing the surroundings and weakening the artificial structure.

After vulcanizing, finish the rubber to a shape continuous with the artificial crown, as near like a natural tooth-crown as may be. The projecting rubber pivot is left for final fitting at the last sitting of the patient.—*P. T. Smith, in Missouri Dental Journal.*

A SIMPLE METHOD OF REGULATING THE TEETH.—It is quite possible that the plan that I have for some time practiced and which I now propose to describe is not original, but as I have never seen any published account of the same simple method of regulating teeth, it is desirable that it should be made known, either to be more extensively adopted, or, if found wanting, thrown aside.

A typical case will show the plan I adopt, more readily than any general description. The engraving shows a very common form of dental irregularity. No extractions are necessary; there is simply displacement, due probably to the eruption of the canine teeth acting upon a somewhat contracted jaw, the affected teeth having probably a natural tendency inwards, owing to a somewhat prominent premaxillary region. Still, with the arch restored to its natural form there is ample room for all the teeth. Models



are made of the mouth for the sake of recording the case, also to ascertain the precise relations of the various teeth to each other.

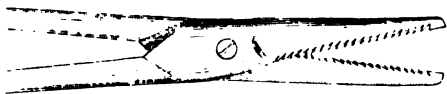
Examining the mouth and models, we see that the principal thing to be done is to bring the laterals out, and after that the bicuspsids on each side of the upper jaw.

The following is the plan to be pursued: After measuring the distance across, from the most prominent part of the *labial* surface of the canine to the center of the *labial* surface of the central incisor, cut off a stick of compressed hickory (in the round form) of the measurement obtained, split the stick in two, or cut it down till you have a half-round stem of wood, the one surface being quite flat; trim up the ends so that they do not present any sharp edges to the lip. This can be applied to the mouth or model, the two ends resting by the flat surface upon the canine and central teeth. Care must be taken that free space exists between the surface of the wood and the lateral that is to be drawn forward; if the flattened surface is in contact, room may be given by filing a concavity in the wood immediately over the tooth. The wood being

fitted in a satisfactory manner, a piece of gilling-thread (American hemp, small size) is passed double between the central and lateral, and then, passing behind the lateral tooth close to the neck, the double thread is brought out again between the lateral and canine. We have then, on the labial side, the loop projecting next the central, and the two ends of the double thread projecting next the canine, while on the lingual surface we have the double thread closely embracing the neck of the lateral. If we now tie the two ends of the thread (next the canine) together so that they embrace the end of the hickory, the other end being embraced by the loop, we exert considerable pressure upon the lateral tooth: (1) by the mere tying; (2) by the contraction of the thread as it becomes moistened by the saliva; and (3) by the expansion of the compressed hickory tightening the thread still further. This appliance needs renewal twice a week, but intelligent patients can do it for themselves or their friends can do it for them. The result obtained in three weeks by this method, in the mouth that I have figured as a typical case, was most satisfactory.

It is obvious that the same principle can be applied to the treatment of a great variety of irregularities, modified, of course, according to the requirements of each case. At the same time I may remark that its advantages over treatment by plate are considerable: (1) it is not liable to displacement; (2) the teeth can be kept clean without removing the thread and wood; (3) the progress made is easily seen and recognized both by patient and operator; (4) the pressure is continuous, and not under the control of the patient; (5) it is not unsightly in appearance; and, lastly (6), it is inexpensive, so that in hospital practice many more patients can be treated than by the old method.—*Oakley Coles, L.D.S.R.C.S., in Monthly Review of Dental Surgery.*

TOOTH-EDGED CUTTING-SCISSORS.—I have recently had constructed for my use a pair of tooth-edged cutting-scissors on the plan shown in the diagram. The scissors are of the ordinary construction in all respects except in the cutting-edge. The cutting-edge of each blade, instead of being even and sharp, is divided into finely-pointed teeth, each tooth being directed with a slight inclination towards the handle of the scissors. When the blades meet, the teeth cross each other, and as they pierce any structure that may lie between them, they crush also, between their surfaces.



If a piece of moderately-firm substance be placed between the blades, —a piece of paper or thin card, for example,—the scissors perforate it in a series of perforations resembling what is seen in the postage-stamp, —that is to say, they do not cut clean through the substance so as to leave it in two distinct parts at once. A little lateral or half-rotating movement of the closed blades is, however, sufficient to tear through the still connected lines of substance and to complete the separation. The same occurs if the substance placed between the blades be a portion of soft animal structure, only that more force is required in the lateral or rotating movement to cause complete separation. The parts

punctured are crushed between the teeth, and are separated by the twist or torsion.

I find these scissors useful in dividing directly and quickly structures in which there are many minute blood-vessels, and which, when divided by the knife, bleed freely. These toothed scissors, as they can be made at one and the same time to pierce, crush, and twist, control bleeding remarkably.

It occurred to me at first to modify a pair of torsion-forceps so as to make them cut with toothed edges at the part where they compress, and I use a forceps thus modified with success. Mr. Perkins, Jr., of Baker Street, brought me one day a patient with an epulis. The gum beneath the base of the tumor was much thickened and vascular, but with my toothed forceps I cut through easily, and removed the whole mass quickly and thoroughly, effecting a good cure. But I found a want of purchase in handling the forceps, so I determined to carry out the method with scissors, as above described. . . .

I have put the scissors to a good test in a case of epulis, in a patient under the care of my friend Dr. Davson. In this instance the tumor was increasing rapidly, and three teeth were involved in it. It was very vascular, had a broad base, and might at first sight have been taken for a malignant rather than for a fibrous tumor. The three teeth being extracted, I found I could get a deep grasp of the tumor between the blades of the scissors. I carried the teeth of the scissors well through the base of the tumor, crushing some portion of bone in the way, and gently and easily twisted the mass off, and lifted it away upon the blades without the loss of any blood whatever. The healing in this case was rapid and good.—*Benj. W. Richardson, M.D., F.R.S., in Medical Times and Gazette.*

RULES IN GIVING ETHER.—A few purely practical suggestions, in a familiar form, however superfluous or even trite to a part of the surgical world, may perhaps not inappropriately serve as a record of the current views and practice of etherization in the hospital with which I am connected—which has, perhaps, a larger experience than any other of this form of anæsthesia.

1. Accept the odor and bulk of ether as a cheap compromise for the safety of the patient and the confidence it gives the operator.

2. Believe that its anæsthetic effects, whether pleasant or objectionable, do not differ materially from those of chloroform.

3. Recognize the fact that, while chloroform may kill without warning, ether never does.

4. Aim at anæsthesia by inebriation, not by asphyxia. With ether vapor, insure air to the patient. Though he struggle at the beginning, if he is not rigid or too livid it is safe to compel inhalation; but if you can devote more time to the process, the resistance will be often less.

5. Use, and let hospital assistants use, a good-sized bell-shaped sponge; and then it may be a question of less rather than more air. The various forms of apparatus which restrict or graduate the quantity of air require more attention and more assistance. Of these, a close bag is the worst. If the sponge is damp, it retains ether better, while the vapor is perhaps a little softer than when absolutely pure. The ready ignition of the latter suggests the precaution of moistening with water

the skin and saturated linen, before employing near the face even galvanocautery.

6. Keep the pulse in hand; at any rate, examine it often. When the pulse is right, the patient is so. With chloroform, the pulse may be right and the patient wrong. If slow or feeble,* or if the patient snores more than he need, save his strength by giving air—at any rate, until the pulse comes up; but renew the ether before he is sensible of pain. If the pulse shows that he is suddenly faint, lay him down and give him air.

7. If the patient is livid or rigid, give him air.

8. If his glottis contracts, give him air.

9. If he breathes badly, put the finger inside the cheek to admit air over the base of the tongue.

10. Should he vomit, of which there is usually timely notice, give the matter free exit by turning the patient, if recumbent, well to one side. Although there is less nausea with an empty stomach, it is not well to starve a patient about to encounter a protracted operation.

11. From time to time evacuate the tracheal mucus from the fauces, during an expiration, with a sponge held in dressing-forceps.

12. In operations about the nose and mouth, give, for convenience, a powerful dose before beginning. Impregnate the whole circulation to the degree it usually attains in the middle of a long operation. The patient is then easily kept quiet. Otherwise a volume of fresh blood may find its way to the brain, and suddenly revive him. Let the repeated dose be also heavy.

13. In these operations, expect blood in the trachea, and evacuate it like the mucus—but, by reason of its quantity, more promptly.

14. Indeed, if such an operation promises much blood, have a tracheotomy tube ready, with hooks to hold the incision open while they compress the veins, so that the tube can be entered by a cut or two in a few seconds.

15. Or insert the tube before the operation, and put a sponge in the pharynx. The patient may then be etherized through the tube. I have had occasion to resort to these expedients.

16. In artificial respiration, act with the patient, and not against him. He will not cease to breathe at once, and wholly. Enjoin silence; watch the first attempt at inspiration, and at the expiration compress the thorax, aiding its elastic reaction, if absolutely necessary, by Sylvester's, or other quiet method. See that the tongue is well forward.

* Here is the precaution against danger; . . . this sign is the diminution of the force and frequency of the pulse.

"In an early case of the administration of ether by Dr. Morton, and which has been reported, the danger from over-narcotism was quite as imminent as in any case I have since seen alluded to. As a bystander, on that occasion, I casually felt the pulse, and found it barely distinguishable; and though it subsequently still decreased, the means at once adopted for the restoration of the patient proved ultimately successful. This occurrence pointed to the pulse as an index of the stage of narcotism; a few subsequent experiments confirmed the belief; and I have not since hesitated to push etherism to complete insensibility, and to continue it, if necessary, during a length of time, provided the pulse remained full and strong. If it be retarded by ether, it is curious to observe with what certainty it recovers force and frequency after a few inspirations of pure air. It will be inferred from these remarks that the pulse is to be carefully examined during the whole anæsthetic process, and that inhalation is to be temporarily discontinued at its indication."—*Anæsthetic Agents*, etc., 1848.

17. Do not cool the patient by exposure and wet surroundings.

18. Being first assured that he can swallow a teaspoonful of water, feed him, if you like, with stimuli, during the expiration, but not the inspiration.

19. Give to all painful surgery, without exception, the benefit of anæsthesia; but a patient unequivocally exhausted by long disease—of the bladder, or of a joint for example—or an habitual inebriate, may require care; without which, protracted narcotism may gradually depress his pulse beyond the rallying-point. On the other hand, a healthy laborer, who reaches the hospital some hours after a railroad accident, cold, and literally pulseless at the wrist, from hemorrhage and exposure, is, as a rule, stimulated by the ether, during and after at least one amputation.

20. Notwithstanding every expedient, there is occasionally an untoward subject who is habitually tetanic or livid whenever etherized; or, more rarely, one whose respiration is notably intermittent before he becomes insensible. The latter requires attention. In children, it may be added, anæsthesia is cumulative.

Such are some of the minor considerations and prompt precautions which collectively determine the question of life or death in the exceptional emergencies of anæsthesia by ether. Many of them apply with equal force to chloroform; but against the shock of chloroform and its sequences, whether "chloroformic syncope," "cerebral anæmia," or "cerebral congestion," precaution avails nothing.—*Henry J. Bigelow, in Medical and Surgical Journal.*

ON THE INHALATION OF NITROUS OXIDE, NITROGEN, HYDROGEN, AND OTHER GASES AND GASEOUS MIXTURES.—In No. 100, vol. iii., of the *Medical Times*, appears a translation from the French of Drs. Jolyet and Blanche, on the protoxide of nitrogen, in regard to its effects upon living organisms. Having been independently pursuing the same or similar investigations for some time past, I take this opportunity of laying my results before those interested.

I was led to undertake the experiments described herein, by a consideration of the effects of the inhalation of nitrous oxide gas upon the different persons to whom I have seen it administered. There are certain marked effects produced by respiring nitrous oxide, which I believe are common to all persons,—certainly to those cases coming under my immediate notice.

The first marked effect of nitrous oxide inhalation is a quickening of respiratory movements, which effect continually increases up to the period of insensibility. In some cases the breathing is very rapid and laborious, two or three inspirations being made per second.

Another effect, that seems to be common to all cases, is that during the period of unconsciousness, so called, there is left scarcely more than a bare idea of existence: all other ideas seem to be obliterated. Another common effect is, that before the period of unconsciousness there is a confusion of ideas. The appearance of a person who has become unconscious from the inhalation of nitrous oxide is evidently that of asphyxia or suffocation. The countenance assumes a leaden hue, the eyes lose their lustre and have, instead, a vacant stare. These considerations led me to the conclusion that the effects, as above enumerated, were the results of true asphyxia, rendered bearable by there being

furnished an inert gas with which the lungs may be filled and emptied as often as may be. The case may be compared to that of a hungry man satisfying the craving for food by eating clay or other inert substance, but who would certainly starve if the practice were continued, at the same time that he would require to make very *frequent* use of the clay to allay his hunger.

In order to become fully satisfied of the real state of the case,—that is, that the effects above cited are due to incipient suffocation or partial asphyxia,—a few experiments were tried.

It was naturally supposed that other inert gases, as hydrogen and nitrogen, should, if breathed, produce effects almost the same as those of the nitrous oxide, assuming the effects of the latter to be in reality due to asphyxia.

The following is an account of the experiments conducted, and the deductions from them :

* * * * *

The above experiments lead me to adopt the following conclusions :

1. That the insensibility produced by the inhalation of nitrous oxide, nitrogen, hydrogen, and rarefied air is due to deficiency of oxygen, of which asphyxia is a result.

2. That the inert gases, nitrogen, hydrogen, etc., as well as a vacuum, are rendered capable of supporting life if a proportion of oxygen approaching that existing in common air be introduced.

I cannot agree with the conclusion of Messrs. Jolyet and Blanche that the respiration of nitrous oxide is at all dangerous if stopped at the proper time, for the experience of all who have used it shows that the asphyxia it produces leaves no harmful effects.—*Elihu Thomson, in the Philadelphia Medical Times.*

RESUSCITATION FROM CHLOROFORM-NARCOSIS (*The New Orleans Medical and Surgical Journal*, November, 1873).—In the course of an extended experience in the administration of chloroform, it has happened three times to Dr. M. Schuppert that, to all appearances, the narcotized subject died,—that is, respiration ceased, the heart stopped beating, and muscular contractility became extinct. The method he adopted for resuscitating these patients consisted in reversing the body, either by hanging them up by the feet or laying them over a bed or table so that the greater part of the body with the head hung down. In that position artificial respiration was also tried. In one case five minutes elapsed before there was a natural inhalation. All of them recovered. Dr. Schuppert believes that in cases of death from chloroform the primary cause of the cessation of the respiration and circulation rests in anæmia of the brain, and not in impregnation of the blood with carbonic acid.—*Philadelphia Medical Times.*

NURSE'S SORE MOUTH.—Prof. N. S. Davis (*Chicago Med. Ex.*) remarks: "Many years since, a careful study of the phenomena of the disease led me to regard it as arising essentially from a deficiency of phosphatic salts in the blood. The woman, in furnishing from the blood the material necessary for the nutrition and growth of herself and child, does not assimilate these salts fast enough to supply the demand. The indication for treatment is chiefly to supply this deficiency; and no *tonics*, merely as such, which do not contain these salts as prominent constituents, will do any permanent good. If, as soon as the patient

begins to feel the scalding and tender sensations in the edges of the tongue and mouth, she is required to take, regularly, a fluidrachm of the compound syrup of the hypophosphites at each meal-time, and at bedtime, with plain, nutritious food, and a little fresh, out-of-door air, every day. it will generally arrest the progress of the disease effectually, and she will remain well so long as she continues the medicine from two to four times a day. But in many instances it will be found necessary to keep up the supply of medicine during the whole period of nursing.

"In several instances under our care, the omission of the medicine for two weeks during any part of the time would result in a renewal of the symptoms of trouble in the mouth and stomach; but with the renewal of the medicine the symptoms would disappear.

"There are several other prescriptions which will answer a similar purpose. One of the best is the mixture of extract of malt, two parts, and compound syrup of hypophosphites, one part, given in doses of a small tablespoonful at each meal-time. If the disease is neglected, or treated with ordinary tonics, or stimulants, or both, until the mucous membrane of the mouth, fauces, stomach, etc., is already extensively ulcerated, and the blood of the patient extremely impoverished, no treatment may supersede the necessity for weaning the child."—*Southern Medical Record*.

APHTHOUS STOMATITIS COMMUNICATED BY A COW.—This interesting case was related by Dr. Hérent to the Société Médicale de Bruxelles, and recorded in a recent number of *Le Scalpel*. The patient was a farmer, aged fifty. On the 26th of October he went to church after drinking a cup of milk taken from a cow affected with aphthous stomatitis. His symptoms supervened in the following order: giddiness, colic, vomiting, diarrhoea, enlargement of face, sore throat, cough, salivation, hoarseness, fever, and hallucination. The mucous membrane of the gums and lips became covered with aphthous patches, some of which ulcerated. Certain parts of the feet and hands, the bursæ and penis, and the elbows, were covered with large bullæ. The treatment consisted in strong doses of opium and alum collutoria, and the patient recovered only on the 6th of November. No medication was adopted for the skin-lesions, which healed up of themselves, the bullæ falling off in epidermic flaps.—*The Lancet*.

NECROSIS OF LOWER JAW.—Mr. Waren Tay exhibited a boy, aged 5 years, who had suffered from necrosis of the lower jaw. The boy had been first seen in February last; he was then under the care of Dr. Cayley for a short time, for some febrile disturbance. At the end of three weeks the gum over the lower jaw was seen to be ulcerated. Soon afterwards, part of the lower jaw was bare. This went on, and several teeth, and some of the alveolus, were picked out by the child. In five or six months more there was evidence of new bone forming underneath. In two or three months more Mr. Tay removed the old jaw by dividing it on each side, first removing the central piece, and then the condyle on the left side. The child had done well; there was at present good up-and-down movement. This was a somewhat rare occurrence. He could not say what was the cause; the child said he had sucked matches. Necrosis may follow the exanthemata or other cachectic states.

Mr. Maunder, referring to the formation of new bone, said that three

years ago he had removed part of the lower jaw through the mouth, from a girl aged 11, for a myeloid tumor. He had taken care to leave the periosteum; but no new bone had formed. Also, in a second case, in which the same operation had been performed on a woman aged 32, four months ago, no new bone had formed.—*Pathological Society of London, Reports in the Lancet.*

PHOSPHORUS-NECROSIS OF THE LOWER JAW.—The patient was a man who had worked in a friction-match factory, about half the time in the dipping-room. The trouble with the jaw had been noticed about two months ago, commencing about the root of a carious molar tooth. The tooth was extracted; soon the disease invaded the alveolar process of the right side, and extended until, at present, the probe detected denuded bone as far backward as the angle of the jaw. The parts external to the bone appeared much swollen, but there was no sinus.

Dr. G. W. Gay performed excision of the diseased bone. The soft parts were divided along the lower margin of the jaw, the incision being curvilinear, and stopping short of wounding the facial nerve. The section of the bone was made with a chain-saw, just in front of the first molar tooth. In closing the wound, the ligatures were brought out at the corner of the mouth. The removed portion of the jaw was denuded of its periosteum, except at its summit.—*Boston City Hospital Reports, in Boston Medical and Surgical Journal.*

MURIATE OF AMMONIA.—Dr. W. J. Barkas, referring to Sir Thomas Watson's recommendation of this drug in that variety of neuralgia affecting the teeth and alveolar processes, says: The prescription I invariably give is—R. Ammon. chlorid., gr. xx; sp. chloroformi, min. xv; tinct. lavand. co., min. x; aquæ, ad. 3j. M. Ter die sum. The chloric ether is added to render the mixture more palatable, and also on account of its action as a diffusible stimulant; for persons suffering from this complaint are often in need of such a fillip. From two to four doses of the above mixture are generally sufficient to effect a cure when all other treatment has totally failed. It is advisable that the remedy be not continued beyond six doses, not because there is any danger in its administration, but because I have found that if recovery has not then taken place, the drug is of no further benefit.

When the pain is very acute, five minims of the liquor morphieæ hydrochloratis B. P., added to each dose, is of great service in its relief. The cessation of pain here is not due to the morphia, for such a minute dose, given alone, would not have the slightest effect; but it appears to quicken the action of the chloride.

Upon observing the rapid recovery in the above class of cases, I determined to employ the chloride in the treatment of other varieties of neuralgia. The only varieties, however, that seemed to be much benefited, were those in which there could be traced a history of rheumatism or gout, either hereditary or acquired. Of these forms, neuralgia, sciatica, and lumbago are the most frequent.—*Southern Medical Record.*

CROTON-CHLORAL HYDRAT.—The profession and the public are chiefly indebted to Dr. Oscar Liebreich for the introduction of chloral hydrate; and this obligation is further increased by the addition of croton-chloral hydrat, which will doubtless prove an equally valuable therapeutic agent. It is of the greatest service in cases of nerve-pain. Every

sufferer from neuralgia is anxious to obtain speedy relief from pain : this may be obtained by taking croton-chloral hydrat, and then the antecedent causes of the neuralgia may afterwards be inquired into and treated accordingly. The following cases are interesting, as showing the immediate relief from pain that this drug affords :

A. suffered from facial neuralgia of a most severe character ; it affected her hearing and eyesight. She could not rest or take food. She took one grain of croton-chloral hydrat every hour. In three hours she was considerably better. After taking three more doses, she was entirely free from pain.

B. suffered much from facial neuralgia dependent on decayed teeth, and had not been able to take food or sleep for three days. She was ordered croton-chloral hydrat in grain-doses every hour, and obtained great relief after two doses. Six doses removed the pain completely. She slept that night.—*Benson Baker, in British Medical Journal.*

IODOFORM IN ETHER.—Dr. Gubler (*Journal de Pharmacie et de Chimie*) employs the ethereal tincture of iodoform for external application. From the rapid volatility of the solvent, that substance is left in a state of extreme tenuity and covers the surface in a uniform manner. The solubility was carefully determined, and the following formula is the result :

Crystallized iodoform	1 gramme.
Ether	4 grammes.

—*Medical Press.*

DIFFERENCE OF PHYSIOLOGICAL ACTION OF INDUCED CURRENTS ACCORDING TO THE NATURE OF THE METALLIC WIRE FORMING THE INDUCED BOBBIN.—M. Onimus.—The author made exactly similar bobbins of copper, lead, and German silver wire. When the wire of the bobbin is a bad conductor of electricity, the muscular contraction produced is stronger, and the impression on the cutaneous nerves is less vivid, than with good conductors, as copper. These effects are more marked the greater the exterior resistance. The current induced in bad conductors has greater tension than that in good, and less quantity. Coils of German silver wire may, in accordance with these facts, be advantageously used in electro-medical apparatus.—*Chemical News.*

HARDENING STEEL.—Instead of hardening steel by plunging it into cold water and afterward lowering the temper, which is thus made too high, Captain Caron recommends the use of water which is warm enough to produce just the desired hardness. The temperature of the water will depend not only on the temper desired, but also on the size of the articles, and is easily ascertained by trial. For the springs in the needle-gun he used water of about 130° F.; for some kinds of steel boiling water is preferred. The effect of cooling in hot water on soft steel containing 0.2 to 0.4 per cent. carbon is to increase its tenacity and elasticity without much change of hardness.—*Journal of Applied Chemistry.*

CASTING.—A very small quantity of chloride of calcium added to the water with which the sand is moistened will keep it permanently damp, and save trouble. This need only be done once.—*Practical Hints for the Laboratory and Operating-Room : Fletcher.*

HINTS AND QUERIES.

PATHOLOGY PERVERTED PHYSIOLOGY.—"The strength of modern therapeutics lies in the clearer perception than formerly of the great truth that diseases are but perverted life-processes, and have for their natural history not only a beginning, but a period of culmination and decline."

PERHAPS there is no mistake more frequently made, than the one attributing cures to remedial action which are really due to natural effort. In the larger proportion of cases we are called to treat, the natural tendency is to health, for within certain limits the human organism embraces within itself the elements of recuperation.—W. C. HULL, M.D.

THE study of the science of medicine having for its object an understanding of the cause or causes of disease, and of the laws which regulate morbid movement, embraces in reality a survey of the whole phenomena of life; for without a knowledge of the latter, we could never arrive at unimpeachable conclusions as to the former.—E. B. TAYLOR.

SOME time since, I extracted for a gentleman a left superior first molar which had been filled by a prominent dentist of San Francisco in the following manner. Will he or some other reader of the *Cosmos* explain the *reason* for such an operation?

The buccal roots had been filled with os-artificiel; the pulp-cavity contained a layer of gold-foil, and immediately upon this there was an amalgam filling.—"FRISCO."

STEAM IN DENTAL OPERATIONS.—No operator can long use a treadle burring-engine without a hearty wish that some one equal to the task would show how steam can be successfully harnessed to the work. Now, if Dr. Babcock, as stated in the January *Cosmos*, has succeeded in that direction, and is willing to enlighten his brethren, will he please "rise and explain"?—G.

OXIDE OF TIN.—Dr. Arthur, in his recent work on the preservation of the natural teeth, recommends the oxide or "putty" of tin as a suitable polishing-powder for giving a high finish to enamel and dentine.

I have been using it for a year for this purpose. Some of my patients complained of the proximal surfaces so polished being quite sensitive subsequently. Three or four days since, a patient happened to mention that the polishing material had a sour taste. Of course it was promptly tested, and the extreme red of the litmus-paper showed a most decidedly acid reaction. A little soda makes it all right, however. This to warn others.—J. S. LATIMER, D.D.S.

MALARIAL INFLUENCE IN THE TREATMENT OF EXPOSED PULPS.—As the most of what we read relative to the treatment of exposed pulps speaks exclusively of local treatment, we conclude that there are districts more blessed than our own in the absence of influences with which the dental practitioner has to contend.

It is painful to us all that pulps take on special pathological conditions which the finest mechanism cannot restore to health. It is painful, because a reliable prognosis cannot always be made even where we have taken most pains. Who of us can be honest and say that he has not sometimes had his labor for his pains?

In the South Atlantic and Gulf States, especially that portion lying along the coast, there seems scarcely any time of year when malarial influence is not

present, to a greater or less extent. With a large majority of persons does it in no way oftener present than in the complication it offers in the treatment of these delicate organs of which we are speaking. Its reflection upon them renders the best local treatment of no avail until anti-malarial constitutional remedies are used. We have seen many cases where local treatment had little or no effect until the patient had been put under the influence of quinine. Indeed, we have known inflammation in the nerve-pulp quietly subside under quinine alone, when no local treatment was used, showing that the malarial poison may keep up a local abnormal condition so long as the point is a weak one for the reflection of constitutional impressions, and that local applications alone, tending to produce temporary inflammatory conditions, help to keep it a weak point. There seems to be a tendency on the part of malarial neuralgia to follow old trails; it is therefore that, when judicious treatment has been employed, the pulp covered and the tooth filled, and there is a recurrence of malarial affection, pain will again seek out the old weak point, but will, if treated early, usually yield to a few anti-periodic doses of quinine. It seems that, no matter how well you may have doctored the pulp, time and *protection* are necessary before it will take on the full tone of health.

The number of cases in which these ideas have been useful to us, and the general silence on the subject by others, has prompted this writing.—E. L. HUNTER.

REPLANTING TEETH.—Having noticed in recent numbers of the *DENTAL COSMOS* several articles on replanting teeth, I will mention a few cases that have come under my notice during a practice of over thirty years: In 1848, Mr. B., a young man in this town, went into a doctor's office with an aching tooth, and, having more courage than skill, undertook to be his own dentist. Taking up a *turnkey* that lay on a table, he succeeded in getting it hooked on to a lower molar, and with one good twist wrenched it out, but on examination found he had got the wrong tooth, and one perfectly sound. The doctor laughingly said to him he had better put it back, which he did immediately, and it soon became as firm as any of his teeth, and has ever since been a very useful member of his family of molars, until last June, when it became diseased (having in the interim decayed and been filled), and he called on me with the toothache, at which time he gave me the above account, although I had heard him mention the circumstance several times before. As age came on his courage had failed, and I was obliged to administer gas to extract the same tooth which he had extracted and replaced thirty years before. It required almost as much effort to extract it as any tooth I have had occasion to remove. I have the tooth in my office, labeled for future reference.

About four years ago, I had occasion to fill a superior lateral incisor for a Miss H., which her father, an M.D., had extracted and replaced some six months previously, and which at the time of filling was as firm as any tooth in her mouth, and remains so up to this time, never having given her any trouble. I have myself within the last year replaced two teeth, one a lower bicuspid and the other a lower eye-tooth, both of which soon became firm and healthy without any appliances whatever.—L. GILMAN, *St. Albans, Vt.*

ROTTEN RUBBER DAM.—A very frequent complaint of many in the profession is that they can rarely get a good article of rubber dam, and that much annoyance is caused them by the tearing of the rubber when being stretched over a tooth. A recent experience has impressed me with the conviction that probably many of these complaints are due not so much to any defect in the quality of the rubber as to want of judgment in its use.

A few weeks since I undertook to fill several teeth for a medical student, and was desirous of placing the rubber dam over the inferior first bicuspid, second molar, and wisdom-tooth, the second bicuspid and first molar having recently been extracted.

Taking a fresh piece of rubber, medium thickness, I punched three holes about the sixteenth of an inch in diameter, and proceeded to place it over the teeth. It passed over the bicuspid readily, but tore in the effort to get it over the molar. Explaining to the patient how difficult it was to manipulate "rotten rubber," I punched new holes and tried again, only changing my tactics so far as to attempt to place it over the wisdom-tooth after getting it in place on the bicuspid, but with the same result and with an increased contempt for "rotten rubber." Cheering my patient with the promise of better luck next time, I sent to the depot for a piece of the strongest and thickest rubber to be had. It came, to all appearance a first-rate article; and, confident of success, I once more essayed its application, and was once more discomfited. Nothing daunted myself, although I must confess my patient was, as his lips were getting sore from repeated stretching, I tried three times more, and conquered neither time. I then decided that the rubber was too thick for that case, and suspended operations until I could again dispatch a messenger to the depot with very emphatic instructions to bring some *thin strong* rubber. I received a piece which, on trial with my fingers, seemed strong enough for any case, but, on trial in the mouth, failed so lamentably that both operator and patient were alike disgusted. Thus, with three different specimens of rubber, and eight trials, the result was summed up in ignominious defeat.

What was I to do? Six cavities prepared for filling, which, by reason of their extending into the cervical walls, could not be filled properly without the aid of the dam. I sat down and ruminated, and light began to dawn. The holes in the rubber were all of the same size, but the teeth were very dissimilar in size. The sixteenth of an inch hole was large enough for the bicuspid, and that gave no trouble. Suppose the holes for the molars were increased in correspondence with the size of the teeth they were to be used on? Lucky thought. I proceeded to test it, although it required some coaxing to obtain the patient's consent; but, that gained, the experiment proved a complete success, and in this—the ninth—trial the rubber passed as easily over the molars as it had previously passed over the bicuspid. My patient, however, went away with his mouth nine times as sore as it would have been had I succeeded the first time instead of the ninth, and I fear with a bad opinion of the rubber dam, not because of any defect in it, but because it was misrepresented through the lack of good judgment in the operator.

Then we are continually making blunders by following the instructions of those in our profession who are called leaders.

For example, Dr. Corydon Palmer, a gentleman for whom I entertain the greatest respect, has devised an ingenious rubber dam punch, with two sizes,—one for the ten anterior teeth, and one for the twelve molars; claiming that the largest size was large enough for any tooth. My experience has taught me that the doctor is mistaken, and that a hole an eighth of an inch in diameter is needed, as a rule, for molar teeth, and in exceptional cases three-sixteenths of an inch is none too large. In fact, the larger the lesion of application, so it is not large enough to leak saliva, the better for both patient and operator. I think it would be found that the majority of the complaints about the rottenness of rubber come from the effort to place it over molar teeth, and especially wisdom-teeth. Of course, the difficulty is increased in proportion to the smallness of the mouth and the unyielding character of the lips and cheeks.

The trouble is that under these circumstances it is difficult, if not impossible, to stretch the hole equally throughout its circumference, and, as the force is exerted more at one point than another, we get a "tear" and call it "rotten rubber." The strongest rubber ever made will tear readily when exposed to an unequal strain; and a piece of rubber with a hole through which you may easily thrust your thumb will give and tear in the effort to place it over a wisdom-tooth.

Where the teeth are very close together, it is a great help to have had a little cotton wedged between them overnight before attempting to apply the dam. It will often save the patient a sore mouth, and the operator time and trouble. I think cotton wedges cause less soreness than any other material I have ever used.

Two recent experiences enable me to speak from the stand-point of a patient in this matter. I know now how it is myself. I have had two teeth filled by first-class operators, one by Dr. Marshall H. Webb and one by Dr. Louis Jack. Both operations gave me entire satisfaction, but the experiences were so unlike that I have learned a lesson which will not soon be forgotten. In one case, a half-hour's time and worry to the operator, and a sore mouth which took a month to get well from the effort to adjust the dam; in the other case, though the dam and ligature had to be applied to the same teeth, all trouble was avoided by a little piece of cotton having the night before been pressed from the necks of the teeth upward until they were slightly wedged apart.—G. B. McDONNELL.

FRACTURE OF THE PALATINE BONE BY EXTRACTION OF A TOOTH—Mrs. G., aged 28, called on me for advice, saying that she had a large tumor in the roof of her mouth which gave her much trouble, and that there was a discharge of offensive matter from her gums so unpleasant as to be noticed by others near her.

On examination, I found a tumor, quite yielding to pressure, occupying nearly or quite two-thirds of the palatine arch, about the size and shape of a common-sized hen's-egg. On slight pressure, an offensive pus would exude from between the central incisors. The left incisor was crowded forward nearly half its thickness, and was quite loose. The lady stated that about eighteen months previously she had had a tooth (the second bicuspid on the left side of the upper jaw) extracted with the turnkey by her family physician. In two or three days the swelling appeared, and in the course of a week had assumed about its present size. For a few days it was very painful, until it commenced to discharge at the point above mentioned. I made an incision about half an inch in length into the swelling, from which an immense quantity of putrid matter was discharged. On probing the wound, I found an opening through the palatine bone about the size of a five-cent piece, a little to the left of the median line, and about an equal distance between the eye-tooth and the first molar.

I injected into the maxillary sinus a solution of rose-water and sulphate of zinc, ten grains to the ounce, from three to six times a day for one week. For the next two weeks I used rose-water and zinc, four grains to the ounce; at the end of three weeks the discharge had nearly ceased, and the patient returned to her home, with directions to keep up the same treatment for two months, with the exception of a day occasionally. At the end of three months the patient came back with her mouth quite well, excepting the opening in the palate. I then took an impression and made a close-fitting gold plate, covering the opening and about two-thirds of the palate, directing her to wear it six or eight months, and use the wash occasionally. By that time the parts could be brought together and ligatured. The lady soon went west, but carried out my directions, and returned in a little less than two years with her mouth perfectly healed, the last operation having been performed by a surgeon in Chicago.—L. GILMAN, *St. Albans, Vt.*

CELLULOID BASE.—I have had very numerous inquiries about the celluloid base, both from our State and from the profession at large; and as the answer to the queries from our State alone would be quite a task by epistolary correspondence, and as the information I have to impart regarding the workings of this comparatively new material will be of general use, will you allow me the privilege, through the pages of the *Cosmos*, of answering some of the queries propounded to me, and giving the results of my experience?

As far as shrinking, crawling, lapping away from the teeth is concerned, I have had none of these things to contend with during the last two years or so, and think if the work is properly manipulated and the company's present plates used, it will not occur; and as to its tenacity in holding the pins, I am persuaded it is much tougher than the best quality of whalebone rubber.

I notice that the oil in the tank ought not to be used too long. Should a score or so of plates be heated up in the same oil, it will cause the plates to turn much darker than is desirable; and when one wishes to use plain teeth, as we can do, and turn out very beautiful work, the loss of the delicate gum-color in darkening is much to be regretted. Of course, where gum blocks (as in rubber) are used, it don't make so much difference, but still I think that after twenty-five times' use the oil had better be renewed with fresh in the tank, and that thoroughly scoured and cleansed.

Another thing: At first I had a good deal of trouble with my models: many of them in the process of pressing, *i.e.* turning down the screws, would break; in some, the rugæ would be almost obliterated; in others, the delicate lines or sharp prominences would be blunted. In vain I tried the best make of plaster, and everything I had heard of to harden the same; painted the surface with liquid silex, and mixed with the plaster many of the articles "to harden it with" that I had seen in the journals devoted to our profession. None of them seemed to act as I wanted them to; but I think I have got it perfect now, and will tell those who may have had similar trouble. On page 627, *DENTAL COSMOS* for November, 1872, there is a method of striking up metal plates by using an alloy of bismuth, block-tin, and lead, which has been in use for many years. By making the models on this method into iron flasks, as sent with the celluloid apparatus, no danger need be apprehended on the score of imperfections of the rugæ, or all the sharp fine lines we all like to see in our finished work, that denotes a perfect model, the prophecy of a perfect fit. The hardness of the dies will allow the operator to use all the force necessary in screwing down the screw, and the fancy of the dentist may put, on the edges of complete sets, beautiful rimmed edges, hollow plumpers, or any of the adjuncts of a first-class set of teeth, and all of a tough substance, as far superior to rubber, vulcanite, or vulcanized gutta-percha, as the most fastidious could desire.

A few words may be admissible on the subject of heat, thermometric range, etc., etc., although experience will be the best guide to the operator. Still, to the neophyte I would say, Be careful. While your piece is in seething olive oil at 310°, gently begin to turn down your screw; briskly at 320°; don't go beyond 330° to 335° if you want a smooth plate; 340°, if you want the lingual side a little roughened. Above this, you run the risk of spoiling the plate entirely, as my microscope shows an increased enlargement of the cells of the celluloid at 350°, quite sufficient to make a spoilt job at 360°, 370°, 380°, and up to 400°, when it becomes so honey-combed with cells as almost to resemble artificial sponge in appearance. This I presume is due to the loss of the camphor in the compound, as after its undergoing this heat I failed to detect any odor of camphor.

The natural toughness of the celluloid is much in its favor, and will, it is presumed, go far to recommend it. By taking a piece of celluloid and a piece of the best whalebone rubber and subjecting them to the process of dilanation, the fibrous striæ will be plainly seen in each, the difference being as marked as between ordinary steel and the well-hammered Toledo blade. That these striæ may be homogeneous all through the plate when your work is done is very desirable, and one of the reasons why I would recommend you not to be in haste to turn down the screws. Take time; let the material mold itself, as it were, feel its way (crawl, if you like the term), and, when the screws are fully down at last, let your piece set awhile in the oil and cool off, say half an hour. It will be much tougher for the treatment, the striæ will then appear by microscopic examination continuous through the plate, and the piece will take on a beautiful polish.

The manufacturers, it seems to me, ought to be willing to work over our clippings and cuttings of celluloid into new plates; it is a pity so much should be wasted. In our laboratory they have accumulated not quite enough, it is true, for our winter's fuel, but quite enough to be suggestive of economic hints. Now that we don't have to chop down a big upper plate to mount a single tooth, as the company are making partial pieces of different sizes, it will doubtless be better; but a half-bushel or so of celluloid shavings and flings on hand suggests the query of re-working them over into new plates.—C. DE MONTREVILLE, *St. Paul, Minnesota*.

ACTION OF NITROUS OXIDE.—In the *DENTAL COSMOS* for January, 1874, I observe, copied into the Periscope department, the summary of the *British Medical Journal* of the conclusion arrived at by Joylet and Blanche in reference to the action of nitrous oxide gas. I wish some one would explain the discrepancy between the statements therein made and the experience of myself and many others in its use. "Chemically-pure nitrous oxide gas," it is said, "will not support the respiration either of animals or plants, as they cannot decompose the gas." If this be true, the inhalation of the gas is equivalent to deprivation of air so far as the sustaining of life is concerned. The facts appear directly antagonistic to this conclusion, as hundreds can testify who have given the gas times almost without number,—each individual to whom it was administered being under its influence long enough to have been smothered, if the gas had no power to sustain life.

Again, it is stated that "Nitrous oxide gas has no special anæsthetic action." The experience of years repudiates this statement, as all will testify who, like the writer, have observed its administration and the entire unconsciousness to pain which results.

During a period of twenty years I have tried almost every mode of producing anæsthesia, local and general, and my conclusion is that pure nitrous oxide gas properly administered is the safest and most effective mode of producing anæsthesia, the conclusions of Joylet and Blanche to the contrary notwithstanding — JULIUS GUTTMAN, *Great Falls, N. H.*

MEETINGS AND CLINICS.—The Dental Society of the First Judicial District of the State of New York has a meeting on the evening of the first Tuesday of each month, at the lecture-room of the New York College of Dentistry.

On the afternoons of the same days, public clinics are held at the dental depot of Dr. S. S. White, to which all are invited.

It is the purpose of the committee to have four operators provided for each occasion.

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No. 4.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
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(Continued from page 621, vol. xv.)

2. Thermal, chemical, and parasitic *predisposing causes of dental caries.*

Thermal.—For many years there has existed an extended belief that such changes of temperature as those to which teeth are subjected during the ordinary food-taking of civilization are exceedingly injurious and immediately provocative of caries; and the various hot made dishes, soups, beverages, etc., are mentioned in this connection as co-operative with the iced and even frozen food which is not unfrequently indulged in. That these are prejudicial to the welfare of the teeth I believe is unquestionable, but I think that they must be viewed entirely as an *indirect* cause of caries.

A series of experiments which I instituted some fifteen or more years since, and which I have repeated quite recently, has fully proved the fallacy of the statement that any alternations of hot and cold to which the teeth could be subjected while yet a portion of any living economy would be productive of that *cracking of enamel* which, even in the latest works, we occasionally see mentioned as the precursor of decay.

Teeth were selected with the various existing conditions of perfect enamel, slightly cracked enamel, and badly cracked enamel, and these were subjected to *long immersions* in freezing mixtures, so long in duration as to be absolutely unendurable to the living tooth, and were then suddenly plunged into boiling water.

From these trials the teeth emerged with enamel perfect, slightly defective, or very defective, but each relatively practically the same as when selected.

Again, teeth, with the same varied conditions of enamel as those previously experimented with, were placed in water of medium tem-

perature, which was then slowly heated until far too hot to be tolerated by living teeth; these were then suddenly immersed in freezing mixtures. The enamel remained, in every instance, as it was before experiment.

Again, enamel submitted to frequent, rapid, and slow alternations of moderate and excessive changes of temperature was found to be practically unchanged; and thus, recognizing, nevertheless, the frequent evidence of tenderness and increased tendency to decay upon the part of teeth which were subjected to shocks from excessive variation from their normal temperature, even when these were employed with a view to strengthen them, as in the use of cold water when brushing, it was found necessary to explain this upon some other hypothesis than that of injured enamel.

This, it seems to me, is easy of accomplishment, and the theory is advocated which suggests impaired nutrition, and consequent impaired power of resistance to irritants, as the result of long-continued habit of frequently shocking, in a greater or less degree, the dental pulp.

I have shown that to this organ is due the entire formation, and practically almost the entire nutrition, of the tooth; and it of course follows that, as this double duty is performed more or less thoroughly, we naturally find an organ higher or lower in the scale of perfection of development, and more or less capable of maintaining its integrity. I have shown that normality seemed to depend most markedly upon a condition of things of which one notable concomitant was normal circulation, and at the same time we found that this concomitant was interfered with as decidedly by marked variations of temperature as, perhaps, any other cause. What, then, is more reasonable than the deduction that a dental pulp, which is subjected year after year to the undue irritation consequent upon frequent changes of temperature, should lose, in vast degree, its protective power, and thus permit the disintegration of such formed dental tissue as it might under other circumstances have maintained intact?

Practice based upon this theory has been happily successful, and I have, in many instances, produced most satisfactory results in the arrestation, or, at least, great retardation, of progress of caries by advising the habitual use of water of moderate temperature for cleansing the teeth, and the abandonment of the habit of using articles of food excessively hot or excessively cold. In this connection I must not omit to call especial attention to the doubly (vitaly and mechanically) injurious habit of taking ice into immediate contact with the teeth, and, more than this, chewing it.

The great systemic injury which results from the *habit* of ice-eating is well known to almost every general practitioner, and we, as specialists, can attest that it is as severely injurious specially as it is generally;

indeed, it is difficult to say whether it is more injurious *mechanically*, by fracturing portions from teeth and thus opening the way for the inception and progress of decay, or *vitally*, by so weakening the strength of pulp-tissue as to render it unduly irritable, inducing painful response to irritants which would ordinarily be powerless for harm, and thus precluding that proper support from it which dental tissue demands for its conservation.

In regard to the enamel cracks, I would state that experiment proves it to be quite as easy to fracture perfect enamel, and increase to any extent the fractures in already fractured enamel, by the application of *dry heat* or cold, or even by moderate *drying*, as it is difficult to produce these lesions by great variations of temperature accompanied by that *moisture* which is ever present in hot or cold food.

And finally, these enamel cracks, from whatever cause, deserve but the most casual notice as predisponents to caries, for it is safe to say that not one in ten thousand of them is found to be the starting point for the development of this form of dental disease.

Chemical.—Under this head we shall find a widely different range of material for consideration from that in relation to which I have just written, for, in common with most authors upon this subject, it seems to me that experimentally as well as theoretically we are led to believe that *chemical decomposition* is most tangibly, *if not most potently*, related to the inception and progress of dental caries. Indeed, it seems to me that, even admitting all the collaterals which are so strenuously insisted upon by the different advocates of the various theories, it nevertheless is a result which must be considered as organically chemical; and thus, in viewing from this point, we take, *first*, the fact that in cavities of dental decay we find almost always a notably acid condition of decomposing tissue, and this diminishes in perceptibility so relatively in proportion to the diminution of rapidity of progress of diseased action, that we are warranted in assuming a theoretic maintenance of this condition even when our tests do not prove positively assuring.

I must at this time, however, direct particular attention to the decided difference which we find to exist between the ordinary chemical action of acids upon such salts and organic tissue as compose tooth-structure and that action which results in caries, for it seems to be no less than *entirely* different. Frequent and long-continued experimentation has failed, in almost every instance, to produce any result which could be considered as analogous to caries; and when, in isolated instances, teeth have been subjected to influences, either accidentally or designedly, which have proven adequate to the induction of a semblance of this disease, it has been found that either the concomitant of galvanism in some form might easily be indicated, or that microscopic research has proven the existence of such pathological conditions structurally as

would indicate decided local predisposition to decay, if even the incipency of actual caries had not been announced by decided "tubular consolidation." This latter has been invariably found in the comparatively limited number of examinations of this condition which I have personally been able to make.

It is somewhat curious, in connection with all the various published results of experiments as to the effect upon teeth of an extended list of so-called injurious articles, embracing the many acids which are in daily use, such as acetic, citric, tartaric, malic, lactic, etc., together with sugar, meats, etc., that we remark only the effects noted, day after day, of enamel so altered in appearance as to have lost its brilliancy, or at length so altered in structure as to be easily scraped away with the finger-nail; or again, of dentine and cementum so softened as to be cut or even bent, and yet no particular mention made of the fact that these results were so unlike caries in every particular as to cause astonishment at their universally allotted position in the books in chapters upon this disease.

This will probably seem more strange when I state that I have experimented with many of these *systemically*, and have soon had results which only too surely proved their power for harm in the production of all the varied antecedents of dental caries, such as sensitiveness generally, with response *locally* to touch, sweets, salt, and sours, together with *local* softening of *dentine* instead of general outside softening of enamel, and that all these conditions have been promptly removed by systemic influence, together with local medication, without the aid of ordinary dental manipulations or the employment of the usual dental remedies for the obtunding of sensitiveness.

Further than this, I have found repeatedly the most beneficial effects produced by the administration of medicines which, used locally in the seemingly accepted method of experiment, would be disastrous in the extreme; for example, nitro-muriatic acid will be recognized as eminently destructive of tooth-tissue, and thus is almost always prescribed with caution in this direction, and with injunctions that it shall be taken through a glass tube lest it make the teeth "decay." I have yet to see the first case of dental caries which I could attribute to the use of any acid medicine, while I have again and again seen remarkably *prompt cessation of dental tenderness and tendency to caries*, resulting from local weakness of tooth-structure consequent upon long-continued biliary difficulty, from the administration of fifteen to twenty drops of nitro-muriatic acid daily.

It has for many years been accepted by observant dental practitioners that teeth are injured, to a certain extent, by the long-continued use of acid medicines; but it has also been noticed that the injury is *general*, just as in the ordinary experiments with acids, that enamel suffers most

of all dental tissues, that it loses its brilliancy and density of structure, and that the cases in which this occurs most markedly are usually those in which the precaution of the "tube" has been faithfully relied upon.

For this reason, I have taught that the "tube" was unreliable for the purpose used, and that such injurious action as was liable to ensue from acid medicaments should be prevented by rinsing the mouth *thoroughly* immediately after swallowing the medicine, using for this purpose water to which had been added a few drops of solution of ammonia, or in which had been dissolved a small quantity of bicarbonate of soda.

Solutions of alum, which are frequently prescribed for many kinds of sore mouth, are found to be injurious in a general way only; acting more or less severely, according to frequency and continuance of applications and strength of solutions; these roughen and soften the enamel, and necessarily accelerate the progress of decay in already-formed cavities, but never seem to cause decay of the teeth in the circumscribed and localized manner which pertains to dental caries.

Probably the only agents which can be considered as directly exciting to caries, which act locally and which attack dentine *almost* to the entire exclusion of enamel, will be found to be the seeds of various fruits, such as raisins, figs, currants, and the like; but in this connection we must consider that the mechanical lodgment and retention of the seed within any formed sulcus or cavity accounts fully for the localization of such effects as naturally follow their acidification.

(To be continued.)

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 120.)

THE UPPER JAW (Continued).

THE PALATAL BONE.—The palatal bone occupies the space which would otherwise exist between the superior maxilla and the pterygoid process. It is placed to the outer side of the nasal chamber and the posterior part of the floor of the nose and roof of the mouth. It enters also into the composition of the floor of the orbit,—assists in closing the posterior ethmoidal cells, and the inner border of the sphenomaxillary space and fissure. It is in the form of the letter L, with the angle produced downwards and the vertical member notched above. In addition to a horizontal or vertical plate, it presents a pyramidal, orbital, and a sphenoidal process.

The *horizontal* plate corresponds to the plate of the same name of the superior maxilla. It is concave above to form part of the floor of the nose, and is nearly flat below, but smooth to enter into the con-

struction of the roof of the mouth. Its anterior border is serrated for articulation with the horizontal plate of the superior maxilla; the posterior is concave, to form the posterior border of the hard palate. Its inner border, when united with that of the opposite side, is pro-

FIG. 20.—POSTERIOR VIEW OF THE
RIGHT PALATAL BONE.



1, palate plate; 2, nasal plate; 3, pyramidal process; 4, articular border for the left palate bone; 5, palate spine; 6, ridge for junction with the turbinated bone; 7, sphenopalatine notch, between 8, the orbital, and 9, the sphenoidal process; 10, groove for the internal pterygoid process of the sphenoid bone; 11, position of the posterior palatine foramen.

FIG. 21.—EXTERIOR VIEW OF THE
RIGHT PALATAL BONE.



1, rough surface articulating with the superior maxilla, and diminishing the aperture of the maxillary sinus; 2, posterior palatine canal, completed by the tuberosity of the superior maxilla; 3, sphenopalatine notch; 4, 5, 6, orbital process; 7, surface directed toward the pterygo-maxillary fossa; 8, maxillary border; 9, orbital surface; 10, maxillary border; 11, sphenoidal process; 12, pyramidal process.

duced posteriorly to form the posterior nasal spine. The junction of the horizontal and vertical portions of the bone is marked by an opening—the posterior palatine canal—and by a sharp ledge of bone extending inwards from the base of the pyramidal process, to give attachment to the palatal aponeurosis.

The *vertical* plate extends from the floor of the nose to the level of the sphenopalatine notch. It is smooth externally, when it forms the internal boundary of the sphenomaxillary fossa. Internally it is marked by two crests,—the upper for the middle turbinated, the lower for the inferior turbinated bone. It is grooved along its posterior border (forming the posterior palatine groove) for the posterior palatine artery and nerve.

Two processes arise from the termination of the vertical plate—the sphenoidal and the orbital. Of these, the *sphenoidal* would appear to be the continuation of the vertical plate. It passes upward and backward as a thin wafer-like lamella, and, curving inward at its extremity, lies along the inner border of the base of the internal pterygoid plate to join the vomer. It thus may be said to enter into the construction of the roof of the nose.

The *orbital* process is more robust. It forms the anterior boundary of the sphenopalatine notch, and enters into the floor of the orbit and

the spheno-maxillary fossa. It articulates with the superior maxilla, the sphenoidal turbinated, and the ethmoid bones.

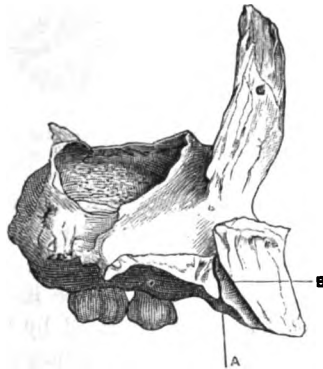
The *pyramidal* process or tuberosity is an elongated wedge arising at the union of the vertical with the horizontal plates. It is directed outwards and backwards to be received into the pterygoid notch of the sphenoid bone. It is marked for articulation with the internal and external pterygoid plates. Between these is a smooth surface which enters into the pterygoid fossa.

The spheno-palatine notch, which lies between the orbital and sphenoidal processes, is connected into a foramen by the sphenoidal turbinated bone of its own side.

We propose dividing the surgical portion of our subject as follows :

- (a) The morbid processes of the upper jaw as influenced by its development ;
- (b) by the relations of the upper jaw to mucous membrane ;
- (c) by the localization of diseased action.

FIG. 22.—PROFILE VIEW OF LEFT SUPERIOR MAXILLA AT ABOUT THE SIXTH YEAR.

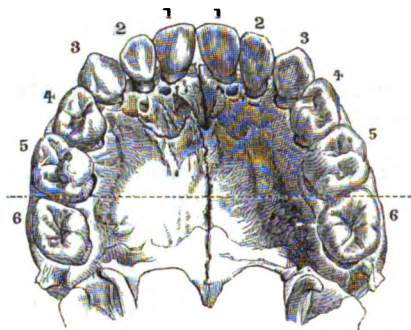


A, the remains of the suture between maxilla and premaxilla; B, the premaxilla.

(a) *Development and growth.*—The palatal and malar bones each arise from a single center of ossification ; the superior maxilla arises from a number, possibly seven. It does not concern us to recall more than two of these, the one for that portion of the bone supporting the canine, bicuspid, and molar teeth, the other that carrying the incisor teeth. The former may be called the *maxilla* proper, the latter the *premaxilla*. When the premaxillæ unite at the median line, the pair of premaxillæ may be denominated the *intermaxillary bone*. But the fact that it is a symmetrical growth, analogous to such structures as the uvula and external nose, should never be forgotten. The suture denoting the nature of the premaxillæ as distinct from the maxillæ proper can be seen at the median line as late as the sixth year (see Fig. 22 A ;

also Fig. 23) and sometimes on the palatal face until the adult condition is attained. But in diseased conditions the identity of the premaxilla is occasionally made very evident. Mr. Hughlings Jackson* describes a case of a boy three years of age, who suffered from severe inflammation of the mouth followed by the exfoliation of the right premaxilla. The bone contained two incisor teeth, the maxilla proper not being affected. Mr. Bryant† gives an instance of the same disease in an adult aged forty-four, from whom an exfoliation was secured which corresponded to the premaxilla.

FIG. 23.—THE HARD PALATE AND SUPERIOR DENTAL ARCH, WITH THE TEETH IN POSITION.



From the skull of a child about six years of age. The suture between the right superior maxilla and the right premaxilla is distinctly seen.

The following is an exceedingly interesting case in this connection. M. C., aged sixty, came under our notice for a defect which prevented his dentist fitting a plate for artificial teeth. He was edentulous, and had from early childhood a cleft in the incisorial portion of the upper jaw, which, as he had been informed by his parents, had been caused by the loss of bone following an attack of measles. The cleft was a little to the right of the median line, and extended upward to the floor of the nose and backward along the roof of the mouth about an inch. The sides of the cleft were for some distance in contact; they parted a little in front; posteriorly a delicate probe could be introduced into the nose. The entire right side of the dental arch was more incurved than the left (Fig. 24).

Here was evidently a case of acquired malformation of the hard palate, the result of early loss of the left premaxilla. After many attempts to retain a plate in position, Dr. J. N. Wunderlich overcame the difficulty by an ingenious contrivance placed on the upper surface

* Med. Times and Gazette, 681, 1862, part 2

† Trans. Path. Soc. London, 1868; also Lancet, 1864, 153.

of the plate, by means of which the passage between the nose and mouth was plugged when the plate was in position.

The fact that both upper and lower jaws are derived from membrane, would apparently explain the rarity of cartilaginous tumors, and equally make clear the meaning of the fact expressed by Gross,* as follows:

“Pure fibrous tumors of the upper jaw are not very common, but in connection with the lower maxilla they constitute the larger proportion of all fibromas in the osseous system.”

FIG 24.—CAST OF HARD PALATE, SHOWING ACQUIRED ABSENCE OF LEFT PREMAXILLA.



The case described by Mr. Hutchinson,† in which the cartilaginous tumor of the upper jaw occupied the canine fossa, but did not grow from the bone, must be considered in every way anomalous.

The law of symmetrical distribution of diseased action is not without example in the upper jaw, though expressions of it are rare. The cases of Lebert and Murchison, cited in the section on the lower jaw, also included lesions of the upper jaw. Fergusson,‡ in commenting on a case of tumor in the alveolus and median line of the upper jaw, says that disease in one maxilla is common, but it is rare to find it implicating both. An instance in which the lesion crossed the median line is described in the same journal, 1859, p. 230.

The *growth* of the palatal and malar bones is consonant with, and dependent upon, the growth of the maxilla proper, and in the malar bone particularly since this bone has intimate associations with the temporal and masseter muscles, it depends in great part upon the growth of the lower jaw as well. Thus we find in the infant the facial proportions are small compared with those of the head, because the

* System of Surgery, ii. 467.

† Med. Times and Gazette, 1850, 231, part 2.

‡ Med. Times and Gazette, 1860, 35.

dental (masticatorial) proportions of both upper and lower jaws have not pronounced themselves.*

(b) *The relations of the upper jaw to mucous membrane.*—The significance of a mucous membrane remaining in contact with bone has been touched upon in the lower jaw. The phenomenon of a mucous membrane bearing special organs of great complexity (the teeth), and securing support by implantation in a bone, is a very curious one. If the hairs of the scalp were to be inserted into the skull, or the moustache in the upper jaw, we would express great astonishment; yet such an extreme proposition is no more remarkable than what is seen to take place in the jaws.†

Such association must modify both normal and abnormal nutrition of the bones. Are we to say less of the palatal process of the superior maxilla and palatal bone, or of the maxillary sinus? We would not be going far from the direct line by asserting that the majority of the errors of nutrition of the upper jaw are of mucous origin. Not that elements of disease originate directly within mucous membrane; for we know that the immediate elements of this membrane do not tend either to start or to extend diseased action. But we do believe that the glandular element of mucous tissue may modify diseased action whenever such membrane is in contact with bone. Thus, cystic tumors of the maxillary sinus are vastly more frequent than in other portions of the body. They arise, according to Giraldès, from enlargement of the glandular follicles which stud the mucous membrane, and are especially conspicuous on the inner wall of the chamber in the vicinity of the outlet.‡

It would be entering too completely the domain of pathology to pursue this subject further, and we must content ourselves with an outline of the deformity arising from cystic distention of the sinus.

A tumor growing in all directions from the sinus would encroach within on the nasal chamber, above on the orbit, without and forward on the face, and downward into the mouth. The most common form of distortion, or at least the most noticeable and valuable form, is the obliteration of the canine fossa. At times the bone becomes thinned, and will crackle under the finger like a piece of parchment. Rarely, as in a case mentioned by C. H. Moore,§ a tumor of the right superior maxilla of about two years' duration, a conspicuous

* Mr. Hilton (Notes on the Cranium, etc., 1855) regards the palatal bone as an epiphysis (!) to the superior maxilla.

† The whalebone pendant from the roof of the mouth, the feathers of certain birds making impressions on the radius, are examples of the same association of integumental and mucous appendages of the skeleton.

‡ Gross, loc. cit., ii. 465.

§ Trans. Clinical Society of London, iii. 89.

thinning of the wall about the position of the canine fossa occurred, which eventually gave way, and the fluid contained in the sinus escaped into the mouth. In other instances, a fistule on the cheek will lead up to the collection, as occurred in a case described by J. H. Howard.* In a later stage of cystic distention, the entire anterior wall of the sinus bulges forward and gives rise to deformity.

After the anterior, the most yielding wall of the sinus is the orbital. As a result of pressure in this direction, the eyeball is displaced and often protrudes, the conjunctiva becoming thickened and inflamed. Pressure toward the nose and toward the hard palate are relatively infrequent. Mr. J. H. Howard (*loc. cit.*) mentions a case in which the nostril was thus encroached upon. The trickling of a fluid from the nostril of the affected side, one would suppose from the communication between the sinus and the nose to be a common sign. Experience teaches us, however, that this opening is often closed in cystic distention.

It is a curious fact that this disease does not involve the lachrymal duct. Tumors of a fibrous and encephaloid nature, on the other hand, may cause overflowing of the tears from such pressure,† as well as paralysis of sensation in the affected part, as witnessed by Fergusson.‡

(c) *The localization of diseased action.*—The origin of solid tumors involving the upper jaw is so obscurely localized that little of definite value can be written of it.

That *necrosis* of so vascular a group of bones as those composing the upper jaw should occur in a degree seen in the following case is certainly very exceptional.

In a male child, aged four years, a month after he had recovered from an attack of measles an offensive discharge was announced from the right nostril. The right eye became prominent, and finally protruded conspicuously. The cornea sloughed, and the globe gave way. The right maxilla, malar, and part of sphenoid bone necrosed. The child died at the end of eleven weeks, of phlebitis of ophthalmic vein involving the base of the brain.

(To be continued.)

* Trans. Clinical Society of London, v. 181.

† Dr. Mason Warren, Surgical Contributions; also, Heath on Diseases of the Jaws, p. 256.

‡ Lancet, 1861.

CONSERVATISM IN DENTAL PRACTICE.

BY DR. C. E. FRANCIS, OF NEW YORK.

(Read before the Odontographic Society of Pennsylvania, January 7th, 1874.)

To enable our patients to retain their teeth for a long period of usefulness is, or should be, the aim of every member of our profession. Careful study, keen observation, sound judgment, and well-applied manipulative skill on the part of the dentist, and good, sensible, persistent care on the part of the patient are usually needed, in the present age and generation, for this end. Comparatively few people in this country pass thirty summers of their mortal pilgrimage with a perfect set of masticators, while many lose half their teeth or become totally edentulous even at an earlier age. And with tolerably good care by dentist and patient, these useful organs sometimes get sadly reduced in number,—insidious caries attacking some obscure point of enamel, then stealthily perforating the dentine and invading the pulp-chamber, destroying not only the vitality of the delicate life-nourishing member within, but also the strength and substance of the entire organ. A renewed attack of caries upon teeth already filled burrowing around and beneath the fillings, or the breaking of a cusp; a neglect of thoroughness in the preparation of a cavity, or a slight defect in the filling, permitting permeation of buccal fluids. These are causes of frequent failures, and who among us has escaped them? None need boast of infallibility. If any operator imagines that he has reached the pinnacle of perfection, he is mistaken. It is a vain delusion. The ladder which he supposes to rest securely against the mountain-top, may perchance lean only upon a sand-hill. It has been said, and with some degree of truth, that he who boasts of infallibility has few successes.

As we become more cognizant of our short-comings, our efforts for improvement should be renewed. Studying more closely into the causes of failures may enable us to obtain better results as we advance.

In one respect at least does our profession resemble all others. We have our pet hobbies to ride, and oftentimes we are so enamored with them that we imagine them faultless and ride them on all occasions, regardless of circumstances, and without reason or restraint. Ultraism and dogmatism are likely to lead to erroneous conclusions. Their subjects are one-sided in all their views—governed by prejudice instead of being controlled by reason. Many a blunder has been made by closely adhering to a fixed rule or by following the lead of some blind enthusiast.

As I have already stated that our profession is not exempt from ultraism, I propose at this time to notice some of the most conspicuous of our "hobbies" and to view them comparatively.

The question of treating *sixth-year molars* has for years past been the occasion of much controversy, and, in all probability, will for many years to come be a subject for discussion in all our society assemblies. Earnest and emphatic have been the views expressed in regard to these teeth, and arguments reiterated with unabated vigor. One class of dentists advocate their removal in nearly every case presented. They view them as pests in a community, contaminating their neighbors by their presence. They condemn them *in toto*, without regard to the texture of their structure or the relation they bear to their co-laborers! Indeed, they never *look* upon a sixth-year molar without an itching desire to "examine the roots." Another class exhibit an equal degree of blind zeal for retaining them. No matter how badly pitted or deficient in lime-salts—heeding not over-crowded conditions of dental arches, regardless of unmistakable tendencies to approximal decay, they would under all circumstances keep these particular teeth. Indeed, we have been told that, as they are the "key-stones" of the dental arches, their salvation is so important that they should *never* be removed, even though their crowns be almost entirely broken away and their devitalized roots the source of alveolar abscess. A careful observation of results will admonish us to avoid either extreme. It will suggest a conservative—a rational—method of practice; not to follow a fixed rule for all cases, but to adopt treatment most needed in each *particular* case. For instance, when we find children with dento-maxillary arches well defined, the teeth fairly calcified and not crowded, and the sixth-year molars in passably good condition, we would by all means advise that they be retained; but if on the other hand the teeth are of low-toned character and badly crowded, exhibiting unmistakable evidences of buccal and approximal caries, and if, as is usual, the first molars prove to be the most defective teeth in the mouth, there is but little doubt that the room they occupy would be more beneficial to their neighbors than their presence. Who does not believe that twenty-eight perfect teeth, which can be retained for a lifetime with comparatively little care, are of greater value than thirty-two badly decayed ones, or teeth loaded with fillings that require constant repairing so long as any vestige of their crowns remain? And yet the permanency of entire sets of passably good teeth is frequently sacrificed from a strict adherence to the dogmatic rule that "it is an error to extract a tooth under any circumstance."

In the treatment of *exposed pulps* we have also radicals of both extremes. Some will devitalize and extirpate, or *endeavor* to extirpate, every pulp exposed; while others strongly condemn such practice, and advise the preservation of pulps in all cases, even though seriously congested or partly decomposed. Now, no one will deny that a tooth containing a healthy living pulp is of greater value than if pulpless,

therefore it seems worth any reasonable effort to preserve them when recently exposed and in a healthy condition; but the practice of experimenting with them when sickly or semi-devitalized, with a view of restoring them to health and functional activity, generally proves a futile undertaking.

Oxychloride of zinc for pulp cappings is by some enthusiasts used wildly. It is even applied to denuded pulps, with no intermediate agent for protection against its escharotic action, and is actually believed to possess some magical sanitary power. Cautiously and judiciously used, it is undoubtedly the best agent ever introduced for pulp-cappings; but it is only safe in prudent hands, it having often proved mischievous.

Contour fillings, too, have their merits and their faults. They are recommended loudly and zealously by some, and denounced earnestly and severely by others. Many times they prove a success, oftentimes result in a failure. Conservatism would suggest discretion, and consider conditions. Where the walls of a cavity are strong, and can be well shaped for firm anchorage, contour fillings are undoubtedly most desirable; but if the walls are very frail, and the fillings are likely to be exposed to great lateral force in occlusion, there is danger of the walls breaking away, causing the fillings to loosen.

The theory of *separating crowded teeth* has its advocates and its opponents. Some will go to a blind extreme in the use of files, chisels, or corundum disks,—giving little heed to conditions, cutting boldly and with apparently little discretion; while others consider it gross malpractice to separate them at all, or to alter their natural shape, whatever it may be. Discretion here will also govern the conservative. He will study his case carefully, taking into consideration the texture, shape, relative position, tendencies to caries, and also the general health of the patient, cutting little or much, as circumstances require or sound judgment may dictate.

In a choice of "material for filling teeth," the spirit of dogmatism to some extent prevails. Not long since very thick gold-foil was by a few dentists claimed to be the only proper form for using gold as a permanent stopping. It was recommended for all cases, and malletted against the calcareous walls of a cavity with a determined zeal, as if to "rule or ruin." Cohesive and non-cohesive foils have also their worshippers. Each is often used with indiscriminate exclusiveness by its devotees. Both possess certain advantages. Then why not become familiar with the properties of each, and use both as occasion may require?

Burring engines are of decided value when used with judgment. They, too, are both praised and denounced. One operator will use his engine for all sorts of work possible, to the exclusion of nearly every other instrument. As pleased with its operation as a child with his

rattle, he keeps it in perpetual motion, while its incessant buzzing upon the patient's teeth oftentimes roughly jars the entire nervous organism. Even though some parts of the operations may be more quickly performed by other instruments, and with less annoyance to his patients, he must still bring out the engine and press it into service. Another operator will look upon the machine as a useless toy, and under no circumstance will he be induced to use it or test its value.

In the manner of introducing fillings, and in the peculiarity of instruments; in medications, and methods of treating oral lesions; in mechanical appliances and arrangement of artificial dentures; and in many other ways do we manifest this spirit of ultraism,—adhering to our views with a dogmatic persistency difficult to be shaken, even though devoid of sense or proved erroneous.

To obtain the best results in our practice, we need be *eclectic*,—willing to gather suggestions from any source; always open to conviction, ready to investigate theories advanced, and then to adopt such modes of practice as may best suit each individual case presented to us for treatment. By faithfully doing this, and by continually striving to improve on the past, we may feel sure that we are moving in the path of real progress, and that our efforts to benefit those who come to us for aid and advice will savor of good results.

SPECIAL TRAINING FOR SPECIAL PRACTICE.

BY GEORGE H. CHANCE, D.D.S.

THE solution of the problem of the education best fitted to qualify students for the practice of dentistry, involves a consideration of the relative advantages of a medical and a dental college, and the special work which each designs to accomplish.

It is granted, of course, in the outset, that there is no danger of any man knowing too much; and, if circumstances allowed, there could be no question as to the desirableness of a thorough training in every department of human knowledge. But the question we propose to discuss is a practical one, and must be considered in reference to the possibilities and in view of the necessities of those who, however eager to acquire knowledge, are compelled to seek that which they can best turn to practical account in their endeavors to benefit mankind.

Premising that the choice must be made between a dental and a medical college, by one who proposes the practice of dentistry as a vocation, which shall he choose, is the question.

What, then, is proposed to be accomplished by the curriculum of a medical college? Is it such an intimate and thorough instruction in every department of medicine, that a graduate may go forth qualified

to take his choice of either or all branches; qualified alike for any? May he expect, as aurist, ophthalmologist, dermatologist, obstetrician, or surgeon, to take his position side by side with the practitioner of these specialties? Has he been taught how to bleed, to cup, to leech, to use the catheter or the stomach-pump, to extract or fill teeth, or even to lance an infant's gums properly? Is he prepared to perform all the operations demanded in surgery; to apply the forceps in difficult labor, or a pessary in uterine displacement? Has he actually acquired the skill expected of him who undertakes to do any one of these, or a thousand other things done every day in medicine? Nay, it were folly to expect such qualification.

What, then, has he been about? what has he learned? what is he qualified to do?

He has, if studious, learned certain broad facts and general principles. He has acquired a respectable knowledge of anatomy, physiology, materia medica, therapeutics, chemistry, surgery, and obstetrics, but only to a very limited extent the practical application of what he has been taught. In a word, he has only laid the foundation of the superstructure,—learned how and where to seek for fuller knowledge. He is not ready for practice, and if entering at once upon general or special practice, must do so at the expense oftentimes of his trusting patient—learning by his failures how to achieve success. This much is all that can be claimed for the average graduate of a medical college. Full surely no man will claim that such an education will prepare one for the everyday operations of a dental specialist.

What, then, we next inquire, is proposed by the curriculum of a dental college?

In some respects the same course is necessary as in a medical college, viz., a knowledge of physiology, anatomy, surgery, chemistry, and materia medica; but no chair of obstetrics is required, nor is the chair of the practice of medicine essential; but in place of these there must be chairs of mechanical dentistry and metallurgy, and of operative dentistry and dental pathology,—special instruction which is not even hinted at in medical colleges.

The assumption, therefore, that the graduate of a medical school is superior to the graduate of a dental school is not admissible. On the other hand, we claim that the dental student who leaves his alma mater qualified to enter at once upon the field of operations to which he proposes to devote himself, though his knowledge may not be as varied as that of the medical graduate, “knows what he knows,” and is prepared to put his knowledge into practical shape at once. This is the advantage of a special school and special training for special work. The graduate of a dental college need no more be abashed because of acknowledged unfitness for obstetrical practice, than need the medical graduate be

ashamed of his inability to perform dental operations. Let him who aspires to general practice, though never so thoroughly prepared, compare his attainments in any special branch with a specialist of that branch, and he will realize how impossible it is for any one man to be proficient in every department. The argument, therefore, that attaching a dental chair to the curriculum of a medical school would be the best way to teach dentistry is fallacious; for, however desirable or necessary it may be for a practitioner of dentistry to have a comprehensive acquaintance with the general principles of medicine, it is not essential that he should be able, off-hand, to give the preparation and dose of every article in the pharmacopœia. Having learned how to turn for such information to the proper authorities, he can readily post himself should occasion require. Moreover, if he should, by dint of hard study, commit to memory all the multitudinous facts involved in the entire range of medical studies, how long could he hope to retain them? Is it not the experience of every man that knowledge not used continually in daily life soon grows dim?

Again, just in proportion as the attention of any one is divided between different topics, must he be less thorough than he might have been on some special subject had his whole effort been directed thereto. In other words, the more time one spends in acquiring knowledge not essential to his calling, the less time of necessity must he be able to give to the special branch.

Let any member of the faculty of a dental college attempt to divide his attention between three chairs, instead of giving his entire attention to one, what would his teaching amount to in either? If, then, one man cannot teach successfully in every department, how can the dental student hope to obtain satisfactory proficiency in his specialty, except by a special concentration upon it.

The men who to-day are the most widely known in medicine are specialists,—“one-idea men;” and it is to that class of men in our own profession to whom we are indebted for the position we occupy to-day. Dentistry is what it is, not because of medical schools, but independent of them. How is it in Europe? Is our science as far advanced there as in the United States? If so, why is it that Europe is sending us students year after year to graduate at our American dental colleges? No; what we need is not a class of men perfect in all the details of practical medicine, but as near perfect as may be in their own branch of practice. We want more *concentration*, greater opportunities of clinical instruction; not merely didactic lectures, models, and diagrams, but to *see* the results of treatment, to be allowed to collect our own evidence and make our own deductions. We cannot consent to lose sight of facts in a multitude of words, but claim the opportunity to verify the lessons of the chair. We need, therefore,

enlarged clinical opportunity and demonstration,—the shortest and surest method of acquiring the skill which, once placed on a scientific basis, increases with every effort.

It will soon become an accepted fact that dental teaching must become constantly more and more practical; and the only way in which this result can be reached is obviously by special schools.

It is true that American dental colleges are not all they should be (the same may be as truthfully said of medical schools), yet, considering the time they have been in existence, they have accomplished wonders; and when, through the co-operation of their alumni, they shall be placed on a more independent footing by endowments, we may reasonably expect still greater advances in the thorough preparation of their students for the special work to which they propose to devote themselves.

Let us then stand by the idea on which dental colleges are founded,—the necessity of special training for special practice. The great advantages which such special preparation gives are too obvious to be denied, and the practical benefits to the community which enjoys the services of those who have experienced such special opportunities, are being more and more recognized.

PROCEEDINGS OF DENTAL SOCIETIES.

PENNSYLVANIA ASSOCIATION OF DENTAL SURGEONS.

At the stated monthly meeting of this association, held at the Pennsylvania College of Dental Surgery on the evening of December 9th, 1873, Dr. Jos. G. Richardson delivered an instructive lecture on "The Nature and Origin of the Salivary Globules, and their Identity with the White Corpuscles of the Blood."

At the regular meeting of the association, held at the same place on Tuesday evening, January 13th, 1874, Dr. Jas. E. Garretson delivered a lecture on "Tumors of the Mouth."

Both of these lectures were listened to with marked attention, and much interest exhibited in the subjects, which elicited some debate at their close.

The thanks of the association were unanimously extended to the lecturers for their able and instructive addresses.

The students of the Pennsylvania College of Dental Surgery were present, by invitation, upon both occasions.

A stated meeting of the association was held on Tuesday evening, February 10th, 1874, in the Pennsylvania College of Dental Surgery.

The subject for discussion was "Periostitis and Alveolar Abscess."

Prof. Buckingham detailed the usual mode of treatment for periostitis, and stated that some persons recommended constitutional treatment, as a dose of salts, hot pediluvia, etc., which would often do good, but most cases of periostitis will result in alveolar abscess in spite of any treatment. He also detailed the history of two interesting cases among his own patients, in both of which the patients professed to have cured themselves with homœopathic doses of *silex*. He was not a believer in homœopathy, yet this remedy, although usually considered entirely inert, might be worthy of a trial when other remedies fail. He had used Dr. Wingate's depurator with decidedly beneficial results in many cases.

Dr. David Roberts, in nerve-cases, practices, as far as possible, the preventive system, and when he finds it impossible to extract all the pulp from the small roots of the molars, he takes the precaution to drill with a fine drill into the nerve-canal, just below the margin of the gum, to furnish an outlet for the gases, etc., formed by the decomposition of the pulp. He also files away those points of the tooth that are likely to come into contact with its antagonist. If inflammation should occur, and resolution cannot be effected by the usual application, instead of recommending raisins or figs, which are difficult to retain in their place, he advises small bags of old linen filled with ground ginger, dipped into hot water and applied to the gums frequently, which is very successful in promoting suppuration.

Dr. Githens had been very successful in relieving the pain of periodontitis by means of drilling through the neck of the tooth into the pulp-chamber, where the latter had not been filled.

Prof. Wildman said that he had found purgation to be very beneficial in the early stages of periodontitis.

Dr. Pettit was in the habit of applying tr. aconite, chloroform, and tr. iodine, and although very often unsuccessful in producing resolution, he believed the pain was reduced to a minimum by this method, as the aconite seemed to produce a partial (local) paralysis of the gum and tissues immediately surrounding the affected tooth. He applied these, either separately or mixed in equal proportions, five or six times a day. He protested against lancing the gums, as it was a very painful operation, and he did not believe it did a particle of permanent good, as the amount of blood removed was so small. It might relieve the pain temporarily, and *delay* the formation of the abscess, which was not desirable, unless entire resolution were produced. He believed the application of the leech to be of much greater benefit.

Dr. W. H. Trueman exhibited two roots of superior first bicusps which he had that day extracted, both of which had large abscesses upon them. One had been filled about five years, and had remained easy some two years, when it began to give trouble at intervals; but

by a little attention it was kept tolerably comfortable until the crown was broken off by accident. On sawing them open it was found that the fillings extended only about one-third the length of the roots, the lower two-thirds being entirely open. In one case an effort had evidently been made to enlarge the canal. He had every reason to suppose the work had been done with care and skill. He did not think any instrument could be made sufficiently small and strong to compact a filling in such compressed and curved roots with any certainty, nor could they be reamed out to any depth without danger of going through the side. In such cases we can only do our best, and trust to nature's indulgence. When such teeth give trouble, he thought the best plan was the old operation of drilling a small hole to the pulp-canal, below the margin of the gum.

Prof. Wildman did not agree with Dr. Pettit in regard to the use of the lance. If the gums were lanced, and the coagulum removed as quickly as it formed, a sufficient flow of blood could be obtained to produce decidedly beneficial effects.

Dr. Downs said that there were many cases of alveolar abscess which would not yield to the ordinary treatment with creasote or creasote and iodine. After treating such cases two or three weeks, if there be no improvement, he had recently been treating them with dilute chloride of zinc in the canal, leaving it in for forty-eight hours, and then replacing it with creasote. Its application is followed by slight pain and some soreness, but he has yet to see a case which will not yield to this treatment. He had known others to use it with the same results.

Dr. Huey spoke of the necessity of keeping the circulation of the part affected reduced. He first lances freely, then has the patient to hold warm water in the mouth to promote the flow of blood, and then applies the rhigolene spray for ten or fifteen minutes. After two or three applications the pain will usually be relieved. In treating abscesses he drills through the foramen with a flexible drill, and applies creasote and iodine, forcing them through.

Prof. James Truman said that, in periostitis, the tooth is very sore and elongated, and, if the inflammation be not relieved, abscess will result. He lances the gums freely, and promotes the hemorrhage by removing the coagulation and then inserting a tent of cotton. There is often relief from it at once. The greater the flow of blood, the greater the relief produced. He had tried Dr. Wingate's instrument, but had not been very successful with it. He thought it might be improved. We want to do more than remove blood from the part. The capillaries must be made to contract. For this purpose ice is not convenient, but rhigolene spray is excellent. Its use at night is dangerous, on account of its explosive properties; and it is expensive; but it is more effective than ether or anything else. It should be applied directly to the tooth,

not to the gum. At first the pain will be increased, but soon subsides. The rhigolene must be kept in a cool place. In many cases, periostitis will result in alveolar abscess in spite of everything; and then we must not wait for figs, etc., but drill through the alveolar process to the apex of the root as soon as pus is formed. This will give immediate relief. This may be difficult when we are undecided as to which root the abscess is upon. If relief is to be obtained, it must come before the patient is allowed to leave the office. Abscesses at the necks of the teeth are the most difficult to treat, as the irritation is kept up by the food, tooth-picks, etc. In the pus from these, more vibriones are found, which also tend to keep up the irritation. In the treatment of these cases, he has always been successful in the use of creasote, when he could apply it over the whole surface. In filling roots, he has been most successful with oxychloride of zinc. If the roots be left open, there will nearly always be trouble; but if they are well filled, abscesses cannot form. Drilling holes in the tooth at the neck simply makes a drain for the pus, etc. It does not relieve the disease permanently. It is better to drill in, so as to fill the root afterwards.

Dr. E. H. Neall agrees with Prof. Truman, and believes that when a tooth is properly treated, all irritants being removed, the root or roots being carefully filled to the apex, periosteal trouble will not occur. When periostitis is present, whether from defective fillings, devitalized pulp, or other irritants, he invariably treats by scarifying the gum, thereby relieving the congestion of the surrounding tissues, afterwards applying tincture of iodine freely. On subsidence of the inflammation, he opens freely into the pulp-canals and fills in the usual manner.

Dr. Spencer Roberts related the following: A lady about sixty years of age presented herself in the early part of November, desiring to have a root extracted in about the position of the first right superior molar. On examination, there was found, instead of a root, an opening into the antrum about the size of that left on extracting a small root. The discharge from it was copious and extremely offensive, and occurred both through this opening into the mouth and through the nares. On syringing it, the office was filled with the odor. The case was treated daily by syringing it thoroughly with warm water containing about four drops of carbolic acid to the ounce. After continuing this treatment for about two weeks, it was so much improved that her visits to the office were reduced to three, and subsequently to two, a week. The latter part of December she was discharged as cured, the opening being nearly closed and no abnormal fluids being present. (This case was seen again Feb. 20th. There had been no further trouble.)

Prof. Wildman exhibited the circulation of the blood very beautifully under the microscope by means of one of Holman's syphon slides.

Adjourned.

E. R. PETTIT, *Secretary.*

BALTIMORE COLLEGE OF DENTAL SURGERY.

THE thirty-fourth annual commencement of the Baltimore College of Dental Surgery was held in Baltimore, on Thursday evening, February 26th, 1874.

An address was delivered by John W. Farmer, M.D., of the graduating class; the valedictory by Prof. Henry R. Noel, M.D. The number of matriculates for the session was forty-five.

The degree of D.D.S. was conferred on the following members of the graduating class by Prof. F. J. S. Gorgas, M.D., D.D.S. :

NAME.	RESIDENCE.	THESIS.
John Abner Chapple	Georgia	Dental Caries.
Lewis Mileston Cowardin...	Virginia	Alveolar Abscess.
Thomas H. Davy.....	Maryland	Dentistry.
Henry Clay Devilbiss.....	Maryland	Respiration.
Afred Eubank	Alabama.....	Digestion.
John W. Farmer, M.D.....	Virginia.....	Chloroform.
Homer Kenyon Green	Pennsylvania.....	Filling Teeth.
Louise Jacobi	Germany	Neuralgia of the Trigemini.
George Vernon Jenkins	Maryland.....	Digestion.
Douglas Malcolm	Maryland	Mechanical Dentistry.
Charles Augustus Mercer ..	Virginia.....	Filling Teeth.
J. Henry Morgan	Virginia.. ..	Physiology and Pathology of the Gums.
James Bruce Moseley.....	South Carolina.....	The Circulation of the Blood.
David N. Rust.....	Virginia.....	Filling Teeth.
Thomas L. Sydnor	Virginia.....	Dentonomy.
Thomas Ritche Vermillion..	Virginia.....	Diseases of the Teeth.
Charles F. Wagner, M.D....	Germany.....	First and Second Dentition.
William B. Wise.....	Virginia.....	The Use of Chloroform.
Silas Robert Wyse.....	Mississippi	Filling Teeth.

OHIO DENTAL COLLEGE.

THE twenty-eighth annual commencement of the Ohio Dental College was held in the Lecture Hall of the College, Cincinnati, February 24th, 1874.

The address to the graduates was delivered by George H. Mosher.

The annual address was delivered by Dr. Geo. W. Keely.

The degree of D.D.S. was conferred upon the following members of the graduating class by Dr. James Taylor, President of the Board of Trustees: Geo. H. Mosher, Jackson, Mich.; Louis L. Dunbar, Cincinnati; William Hare, Cincinnati; W. D. Dismukes, Nashville, Tenn.; J. C. Oldham, Springfield, Ohio; R. W. Morris, Santa Barbara, Cal.; S. W. Moores, Maysville, Ky.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE eighteenth annual commencement of the Pennsylvania College of Dental Surgery was held at the Academy of Music, Philadelphia, Saturday, February 28th, 1874, at 8 o'clock P.M.

The address to the graduates was delivered by Professor Geo. T. Barker; the valedictory by W. P. Richards, D.D.S.

The number of matriculates for the session was fifty-nine.

The degree of D.D.S. was conferred upon the following members of the graduating class by Henry C. Carey, Esq.:

NAME.	RESIDENCE.	THESES.
Emilio Alvarez.....	Central America.....	Odontalgia.
Caspar E. Asay.....	Pennsylvania.....	Artificial Dentures.
Cassan E. Babcock.....	New York.....	Filling Teeth by Classes and Modifications.
John M. Bentz.....	Pennsylvania.....	Impressions of the Mouth.
Charles F. Bonsall.....	Pennsylvania.....	Treatment of Irregularities.
George A. Coe.....	New York.....	Dental Pathology.
Alfredo Carnot.....	Cuba.....	Operations practiced on the Inferior Maxillary Bone.
Frank F. Cook.....	Massachusetts.....	Anæsthesia.
Frank D. Clum.....	New York.....	Periscope of Dental Surgery.
Sherman W. Chipman.....	Connecticut.....	The Physical Heart of Man.
Thomas B. Downs.....	Missouri.....	Taking Plaster Impressions for Partial Dentures.
Hartwell A. Dalrymple.....	Massachusetts.....	Extraction and Nitrous Oxide.
Harry Y. Eastlack.....	Pennsylvania.....	Diseases of the Maxillary Sinus.
Jacob F. Fryer.....	Pennsylvania.....	The Extraction of Teeth.
Domingo Ferrer.....	Cuba.....	Digestion.
Willard L. Ferris.....	Connecticut.....	Anæsthesia.
Francisco A. Goulé.....	Cuba.....	Caries of the Teeth.
Bradley Hull, M.D.....	Ohio.....	Inflammation of the Root-Membrane.
T. Ellis Hancocks.....	Pennsylvania.....	The Necessity of Preserving the Teeth in order to Secure Health.
Manuel Lopez.....	Cuba.....	Dead Teeth, their Treatment.
James A. M'Allister.....	N. B., Canada.....	Preservation of the Teeth and Filling.
Auguste Mésam.....	Switzerland.....	Manipulating Gold for Artificial Dentures.
Arthur D. Murphy.....	Russia.....	Pathology of Dental Caries.
James E. Murphy.....	England.....	Mechanical Dentistry.
Thomas A. Ortiz.....	Cuba.....	Stomatitis.
Annie D. Ramborger.....	Pennsylvania.....	Teeth, their Diseases and Treatment.
William P. Richards.....	Illinois.....	Essential Principles in Practice.
Lannes E. Rogers.....	Iowa.....	Materials for Filling Teeth.
C. Illemuel Reese.....	Pennsylvania.....	Dental Etiquette
Jos. Val. Schneider, M.D.....	Bavaria.....	Nitrous Oxide not a Direct Cause of Death.
Alfred L. Smith.....	Georgia.....	The Blood and its Circulation.
Henry H. Way.....	Pennsylvania.....	Comparative Anatomy of the Teeth.
Valeska Wilcke.....	Prussia.....	The Care of the Mouth and the Teeth.
Henry D. Wilson.....	South Carolina.....	Caries, Causes and Treatment.

PHILADELPHIA DENTAL COLLEGE.

THE eleventh annual commencement of the Philadelphia Dental College was held at the Academy of Music, Friday, February 27th, 1874, at 8 o'clock P.M. The address to the graduates was delivered by Prof. Harrison Allen, M.D.; the valedictory by G. W. Stoddard, D.D.S., of Maine.

The number of matriculates for the session was seventy-eight.

The degree of D.D.S. was conferred upon the following members of the graduating class by J. K. Valentine, Esq. :

NAME.	RESIDENCE.	THESIS.
Wilber W. Bridge	Connecticut.....	Dental Physiology.
Charles H. Bosanko, L.D.S.....	Canada.....	The Fifth Pair of Nerves.
George H. Chance.....	Oregon.....	Special Training for Special Practice.
John H. Devore.....	Pennsylvania.....	Anatomy of the Head.
Carlos Duque Estrada.....	Cuba.....	Nutrition of the Tissues.
John H. Edmunds.....	Canada.....	The Dental Operator.
Samuel E. Greene.....	Rhode Island.....	Nitrous Oxide.
Clark L. Goddard, A.B.....	Wisconsin.....	Exposed Pulps of the Deciduous Teeth.
Andrew J. Gulick.....	Virginia.....	Anæsthesia.
William R. Garrett.....	Delaware.....	Dentition.
Edward Hiltz.....	New York.....	General Anæsthesia.
Cassius N. Kendall.....	Illinois.....	The Teeth.
Julius Lowenstein.....	Prussia.....	Alveolar Abscess.
Robert H. Moffit.....	Pennsylvania.....	Filling Teeth.
John Murray.....	Pennsylvania.....	The Different Medicines used in Dental Practice.
Thomas Moore.....	Pennsylvania.....	Treatment of Exposed Pulps.
Louis A. Nichols.....	Wisconsin.....	Dental Physiology.
Frank E. Pomeroy.....	Vermont.....	Operative Dentistry.
George B. McDonnell.....	Pennsylvania.....	Eclectic Operative Dentistry.
Samuel F. B. Reid.....	Canada.....	Dental Physiology.
G. Carroll Randall.....	New York.....	Benign Tumors of the Mouth.
Benjamin L. Rhein.....	New York.....	The Dental Pulp
Everett A. Shailer.....	Connecticut.....	The Dentist and his Patients.
Walter Saunders.....	England.....	Inflammation.
Eugene D. Schoble.....	Ohio.....	Blood and its Circulation.
Hiram A. Tunison.....	Pennsylvania.....	Dental Periostitis and its Results.
George W. Stoddard.....	Maine.....	Obturator.
Henry M. Vanderslice.....	Pennsylvania.....	Gold.
Arthur Wendlinger.....	Virginia.....	Alveolar Abscess.
Reuben J. Zimmerman.....	Canada.....	Saliva.

NEW YORK COLLEGE OF DENTISTRY.

THE eighth annual commencement of the New York College of Dentistry was held at Steinway Hall, on Monday evening, March 2d, 1874.

The address to the graduates was delivered by Prof. C. A. Marvin, D.D.S.; the valedictory by J. Emil Serrè, D.D.S., of the graduating class.

A written examination in the presence of each examining professor is made to take the place of the usual thesis, and is an addition to the oral examination.

The number of matriculates for the session was fifty-two.

The degree of D.D.S. was conferred upon the following members of the graduating class by Dr. Wm. H. Allen, Vice-President of the College: Albert de Agüero, Wm. A. Dixon, Philip H. Brown, Ignacio Gutierrez, Charles E. Merritt, Bertrand J. Perry, Joseph G. Wedgewood, J. M. Sigismund, J. Emil Serré.

BOSTON DENTAL COLLEGE.

THE sixth annual commencement of the Boston Dental College was held at Boston, on Wednesday, March 4th, 1874.

Dissertations were read by Daniel Bowman Ingalls, Metcalf Everett Pond, and George Francis Harwood.

An address was delivered by Albion P. Stevens, D.D.S., and the valedictory by Gustavus Adolphus Gerry.

The number of matriculates for the session was twenty-two.

The degree of D.D.S. was conferred on the following members of the graduating class by Prof. Isaac J. Wetherbee, President :

NAME.	RESIDENCE.	THESIS.
Gustavus Adolphus Gerry.....	Lowell, Mass.....	Anæsthetics.
Norman Wesley Gilbert.....	Boston, Mass.....	Diet.
George Francis Harwood.....	Worcester, Mass.....	Periodontitis.
A. Washington Howland.....	Lawrence, Mass.....	Alveolar Abscess.
James Madison Huse.....	Boston, Mass.....	Circulation.
Daniel Bowman Ingalls.....	Clinton, Mass.....	Dental Histology.
George Everett Mitchell.....	Exeter, N. H.....	Dental Science.
Metcalf Everett Pond.....	Auburndale, Mass.....	Prevention, Preservation and Destruction.
William Edward Riggs.....	Lawrence, Mass.....	Chloroform.
Francis Joseph Teixeira.....	Terceria, Azores.....	Mechanical Dentistry.

DENTAL DEPARTMENT OF HARVARD UNIVERSITY.

At a meeting of the corporation and overseers of Harvard University, held February 11th, 1874, the University degree "Dentariæ Medicinæ Doctor," was conferred upon the following graduates, viz. :

George Leonard Mason, Edward Dwight Carr, Hanes Eugene Smith, Willis Porter Battles, Frederic Augustus Merrill, Horatio Cook Merriam, Edward Eastman Frost, Franklin Baker Stewart.

MARYLAND DENTAL COLLEGE.

THE first annual commencement of the Maryland Dental College was held in Masonic Temple, Baltimore, on Wednesday evening, March 4th, 1874.

The class address was delivered by Fred. A. Levy, of Richmond, Va. ; the valedictory by Rev. S. D. Noyes, of Baltimore.

The number of matriculates for the session was sixteen.

The degree of D.D.S. was conferred upon the following graduates by C. S. Hurlbut, D.D.S., of Springfield, Mass., one of the Regents, and S. A. Williams, D.D.S., Emeritus Professor :

NAME.	RESIDENCE.	THESES.
Lafayette Adreon	Maryland	Dental Periostitis.
Geo. W. Carruthers	Maryland	Mechanical Dentistry.
Llewelyn Crowther	England	Circulation.
T. W. Coyle	Maryland	Filling Teeth.
Charles E. Duck	Maryland	Deposits of Mouth.
Wm. B. Finney	Virginia	Digestion.
Frederick A. Levy	Virginia	Dental Education.
William S. McDowell	Maryland	Mechanical Dentistry.
J. Emory Scott	Maryland	Dental Caries.
W. S. Norris	Maryland	Nervous System.

DENTAL ALUMNI ASSOCIATION OF HARVARD UNIVERSITY.

THE annual meeting of the Dental Alumni Association of Harvard University was held at the Revere House, Boston, February 11th, 1874, at 3 o'clock, P.M.

Dinner was served at 3½, after which speeches were made by Drs. Fillebrown, Hitchcock and others; at the resumption of business, the following officers were chosen for the ensuing year :

President.—S. F. Ham.

Vice-President.—T. O. Loveland.

Treasurer.—Edward Page.

Secretary.—P. B. Laskey.

On taking the chair, Dr. Ham read an original poem, for which he received a vote of thanks.

Dr. Grant remarked on the death of the late Dr. R. T. Freeman, a member of the association, and the following resolutions were unanimously adopted :

WHEREAS, it has pleased the Almighty to remove from our ranks our esteemed friend and brother, Robert Turner Freeman; therefore

Resolved, That we, the members of the Dental Alumni Association of Harvard University, sincerely mourn his loss, and feel that the profession has lost in him a *true man*.

Resolved, That the sympathy of the society be extended to the widow and relatives of our deceased brother-graduate, and that a copy of these resolutions be forwarded to his widow.

After a pleasant informal discussion, the meeting adjourned. The occasion was of great interest, and there was a very good attendance.

P. B. LASKEY, *Secretary*.

EDITORIAL.

THE GRADUATES OF 1874.

ASPIRATION, labor, denial, triumph, the goal reached, the prize won ! Such is the feeling. What is the fact ? The elements of professional knowledge have been acquired, the foundation laid, the commencement reached. That is all.

What is to be the future of the graduates who this year are sent forth ? With minor differences, they will separate into three classes : routinists, experimentists, progressists.

Those of the first class, having learned their trade, will henceforth follow in the footsteps of their predecessors, and, life being spared, will continue to honor their teachers by doing always just what they were taught to do.

Those of the second class, thinking that all change is progress, will promptly lay the old aside, and as promptly adopt the new. Novelty, hypothesis, experiment, will take the place of experience ; false theories being eagerly embraced, false practice will follow, unfavorable results will ensue ; then distrust of all methods and unblushing quackery.

Those of the third class will begin to sift what they know, or think they know ; will find that much which in the lecture-room seemed of paramount importance, is of little value ; while that which they considered of small account will vastly increase in their regard. Not merely to know facts, but the relations of facts, will be the ambition of their lives. Subjecting every so-called fact to a rigid cross-examination, lest theory should be built upon a foundation of error, and philosophizing upon established facts and their relation to each other, will be the preliminaries of every application or operation.

No man is safe from the extremes of routinism or experimentation, who does not, in every pathological condition with which he proposes to deal, endeavor to comprehend the deviation from a physiological state, the indications for treatment, and the measures which best promise to meet those indications. This only is scientific practice.

General principles, such as have been taught in the schools, are but the foundation on which to arrange individual facts and deduce correct conclusions in individual cases. To know *what* to do is the duty of the apprentice ; to know *why* is the privilege of the expert.

Every one who is to obtain any considerable status in the profession henceforth, must be a philosopher, must have method, sequence of ideas, a system of applying means to ends. Philosophy is an outgrowth of culture—the fruit of intelligent observation and comparison ; and all practice not based upon philosophy is but handicraft. The only path to truth is that of observation and reflection, resulting in a philosophy

or theory. Even a false theory is to the candid investigator far better than none; for the habit of acting only when a well-defined reason can be given for the procedure will inevitably lead to such accurate observation, collation and comparison of facts, and deductions therefrom, as will speedily correct that which in such light is untenable.

The foundation of all science, it has been said, is in the observation of facts and in the knowledge of nature thus obtained. To avoid mere routinism, therefore, it is necessary to extend experience by experiment; but, to be advantageous, experiment should be based on previous observation and intelligent appreciation of principles; otherwise, it is but guessing, with the chances largely against the guesser. Nothing shows more plainly the lack of mental discipline than the love of experiment without scientific basis, and simply in the hope that "something will turn up." Equally indicative of superficiality is the stolid content which accepts as a finality any device of man's head or hands.

VULCANITE LITIGATION.

THE situation has not materially changed since the February issue of the DENTAL COSMOS, except that we are this much nearer the time when a decision in the Smith case may be expected. In the suit brought against the writer by the Goodyear Dental Vulcanite Company for trespass on the case,—heretofore mentioned,—their *declaration* has been filed.

When the courts shall have passed upon these cases respectively, we will have something to say to the profession at large, and meanwhile deem it proper to confine our notice to this simple statement.

SAMUEL S. WHITE.

OBITUARY.

DR. CHARLES F. MERMIER.

At a special meeting of the Brooklyn Dental Society, convened February 28th, 1874, resolutions of condolence were passed upon the death of Dr. Charles F. Mermier, of Brooklyn, a worthy member of the society, who died February 26th, 1874, aged forty-five years.

C. P. CRANDELL,
Rec. Sec'y B. D. Society.

ROBERT F. HALL.

DIED at Auburn, Lee county, Alabama, February 6th, 1874, ROBERT F. HALL, aged 31.

Mr. Hall was a student at the Philadelphia Dental College, but was compelled, by reason of failing health, to return to his home before he had completed his studies.

PERISCOPE.

EDUCATION AND BOOK-KNOWLEDGE.—The high-water mark of a very prevalent theory in education is reached in an assertion, by one of the foremost educators of the day, to the effect that what a man can write out fully and fairly concerning any matter, *that* he knows, and no more. Whatever falls short of this simple and certain test, we are told, is no better than sheer ignorance.

The phrase expresses, with axiomatic terseness, the controlling spirit of the schools; and for this reason, we suppose, it has been echoed right and left as a settled dogma in education. From the primary school up to the highest, excepting a few scientific schools, the grand test of knowledge is verbal expression. The pupil that recites best wins the prize; and as the most credit goes to that teacher whose pupils meet the standard required most completely, the tendency is to narrow the range of teaching to those things which can be most readily reproduced in formal phrases. The premium is paid for words, and naturally the teacher gives more attention to them than to the pupils' mental health or mental development.

Not that facility of verbal expression is to be despised or neglected. It is an art second to none, and worthy of proportionate culture. In many cases it is also a first-rate test of knowledge; but to make it the ultimate test, in all cases, involves a double fallacy, subversive of the highest aim in education. It implies that all knowledge worth having can be expressed in words, and consequently can be communicated by words, either for informing another or for testing his information. It implies, too, that the possession of knowledge necessarily carries with it the power of ready and accurate expression.

The fact is, on the contrary, that relatively but a small part of what one may know can possibly be expressed in words; and much, even of that which can be formulated, may be thoroughly apprehended and practically used by one who could not begin to set it down in logical sentences.

Time was when book-knowledge was thought to be the sole basis of scholarship. All teaching was book-teaching, and it was no more than fair to expect students to prove their knowledge in book-fashion. But that time is past. The bookish estimate of culture no longer satisfies. The library alone can no longer make a scholar; and every scheme of culture which pins the pupil's attention to letters is little better than a wall set around him to keep him from learning what he ought to know. That much of what passes for legitimate schooling is such a wall is recognized by everybody except the pedagogue.

Men of real culture are well aware that ability to do is vastly superior to ability to say; and they believe that the development of skill and power ought to receive at least as much attention in schooling as

the mere accumulation of second-hand facts; but all that sort of basic culture is not merely slighted but suppressed as soon as the test of verbal description is made supreme.

The killing fault with the scholastic test of knowledge is that, from its nature, it fails to reach—as it fails to encourage—more than a single phase of culture, and that one of inferior grade. It measures verbal acquisition only, not skill or power; and since conduct rather than words, ability to do rather than facility in saying what has been done or ought to be done, is the ultimate test in life, and should be the paramount aim in education, the word test is necessarily deceptive as well as inadequate.—*Scientific American*.

ON PREMATURE LOSS OF THE TEETH—The gradual loosening and ultimate loss of perfectly sound teeth is so general an occurrence in aged persons, that it has come to be regarded as one of the ordinary phenomena of senile change, although in an absolutely normal state no doubt the teeth ought to last as long as the rest of the organism. Among domesticated animals the loss of the teeth some time before the death of the animal is of common occurrence; but I do not know that it takes place among wild animals, if we except the teeth of some of the seals, which are shed at a comparatively early period, and special teeth in some animals, such as certain of the bears and the kangaroos, which are shed while the rest of the teeth remain in full functional activity.

It is not, however, of this loss of the teeth at a time when the whole body is showing signs of diminished vigor, that I purpose to speak to-day, but rather of those cases in which, in persons apparently in full bodily health and vigor, tooth after tooth becomes loose and falls out, or is extracted. Little is said about this malady in your text-books, for the reason that, though it is of the utmost importance to the sufferer, its pathology is very imperfectly understood, and its treatment regarded as hopeless, so that the patient is usually told that he must wait until the act of mastication comes to be imperfectly performed, and then fill up the gaps with artificial substitutes; and my intention is to lay before you, so far as I am able, the few reliable data which we have, and the inferences to be drawn from them, as well as to introduce to your notice a plan of treatment, which, although I believe it to have been originally based on a wrong idea of the pathology of the disease, is nevertheless attended in practice with a fair amount of success.

In a typical case of the malady, the following are the usual symptoms: Some of the teeth, very generally at the back of the jaw, and often with exact symmetry on the two sides of the mouth, become slightly loose; the loosening rapidly increases, the gum separates from the necks of the teeth, and pus is, in small quantity, shed out around them. Then the teeth first affected either fall out or become so troublesome that the patient desires to have them extracted, and this process spreads from tooth to tooth, generally attacking in regular succession those teeth which were next to the one first lost, till most or all of the teeth have been shed.

The age of the patient is seldom less than thirty-five, and I have I think more often observed it in males than in females; whether it be a matter of accident I know not, but certainly in the cases which have come under my own observation the freedom of the teeth from caries

has been noteworthy, and I recollect seeing this same remark made by some writer, whose name I do not now remember. When the progress of the disease is rapid there is very generally some little pain of a neuralgic character, rather than localized toothache, though when the teeth have become very loose their movement causes pain, and even may set up active inflammation in the soft parts around them.

The discharge which hangs about the necks of the teeth is exceedingly offensive, and has a peculiar characteristic odor, so that the nature of the case may usually be instantly recognized by the peculiar fetor of the breath, even before any examination of the mouth has been made. The various stages may be studied in one and the same case, for it is rare for many teeth to be simultaneously attacked, and destruction of the sockets of all the teeth at the same time is a thing which never happens in the form of the disease occurring in persons of middle age.

The first indication of anything wrong is the thickening and rounding of the edge of the gum; this should be, as you are aware, quite thin, almost sharp, closely applied to and embracing the necks of the teeth; but it soon ceases to be so firmly applied, and between this thick rounded edge and the neck of the tooth there is formed a groove, which speedily deepens, so that there comes to be a sort of pouch between the gum and the tooth, into which the end of a small instrument may be passed, and which is filled with shed-off epithelium and a little pus; at this time the free edge of the alveolus becomes bare and rough. The detachment of the tooth from the gum becomes deeper and wider, till the edge of the bony socket is reached; this rapidly wastes, though not equally all round the tooth, so that it often happens that a piece of stiff twine will pass up on one side as far as half or two-thirds of the total depth of the socket, while on the other it will not enter at all.

If a steel instrument be used instead of the twine, a grittiness is felt, which, if the tooth be extracted, is found to be due partly to the roughness of the tooth-fang, partly to that of the socket. On the tooth-fang, this roughening is mainly due to irregular absorptions and redepositions of cementum, which often renders the apex of the fang quite sharp and rugged to the touch; small incrustations of tartar are also found upon it. A thin ring of tartar also frequently embraces the neck of the tooth immediately below the edge of the gum, occupying that abnormal channel or groove which surrounds teeth when in this condition. At this period the gum around the affected teeth is spongy, of dusky-red color, and pressure upon it causes pus to exude around the necks of the teeth.

Now, the plan of treatment to which I alluded, which was introduced and warmly advocated by Dr. Riggs, of Hartford, Connecticut, is based upon the assumption, wrongly, as I think, that the deposition of tartar is the real cause of the disease; and as some of his arguments are drawn from the treatment and its results, I will pass on to describe these before discussing the question of its true pathology.

His treatment consists in the absolute removal of the tartar, paying even more regard to that which is below the edge of the gum and within the socket, than to that which is visible. For this purpose he has devised a special set of instruments, by the use of a series of which he affirms that every part of a tooth-fang which has become detached from its investing tissue can be reached and scraped. Not only is the tooth

scraped, *but the free edge of the alveoli*, which, as I have before noted, is felt to be rough and bare, is also scraped until the different sensations conveyed to the finger indicate that healthy bone has been reached. Necessarily the operation is a protracted and rather painful one, though, at all events in the earlier stages of the malady, it is not so painful as might have been anticipated; and, in order to do it efficiently, scalers more or less like Dr. Riggs's must be adopted, for the ordinary forms are perfectly useless for this purpose; and a considerable number of forms are essential in order to thoroughly reach all the surfaces of bared tooth-fang and alveolus.

This treatment thoroughly carried out does certainly bring about exceedingly good results. In cases so severe that the pillow was every night stained with the purulent and bloody discharge oozing from about the necks of the teeth, his discharge was entirely stopped, and the gum more closely embraced the necks of the teeth, which also became again firm, though, of course, not quite so firm as before. Several cases which had been operated upon at various times were shown to me whilst I was in the United States, and I had the opportunity of watching the progress of one myself; moreover, there is the concurrent testimony of many of the ablest dentists in the States, that not only is very great benefit at once obtained, but that after, at all events, two or three years, the malady has not returned.

Now, the unquestionable success of this treatment has been held to be strong, if not absolute confirmation of the idea that this loosening and loss of the teeth is due in the first instance to the deposition of tartar; but the facts admit of a perfectly different explanation, and do not, in my judgment, admit of explanation upon this hypothesis.

Of the occurrence of the tartar upon the neck of the teeth below the edge of the gum, and even down within the socket, where the tooth is detached from the soft tissues investing it, there is no question, for it is certainly there in many cases; the point is, is it *invariably* there, and is it the true cause of all the symptoms, or is it only an accident, so to speak, and a consequence of the detachment rather than its cause. In the first place, is tartar invariably present? Since witnessing Dr. Riggs's treatment I have very carefully examined the necks and roots of teeth extracted when in this condition, and although its presence is the general rule, yet in one or two of the best-marked examples of the disease none has been perceptible with a hand magnifier. Moreover, in one of the cases I carefully felt around the necks of several teeth which presented the earliest indication of mischief—namely, a thick rounded edge to the gum—and was unable to detect any tartar, even at a time when the thin edge of the alveolus was bared, and readily touched by the instrument.

But quite apart from the presence of tartar not being demonstrable in all cases, there are many other reasons which clearly point to some more general cause being at work; amongst others I may enumerate—

(1) That it seldom, or almost never, attacks persons under thirty-five or forty.

(2) That it is often distinctly hereditary.

(3) That although it ultimately involves many teeth, it does not attack them simultaneously, but usually seems to spread from tooth to tooth.

(4) That, *cæteris paribus*, it especially affects dead teeth.

(5) That, whereas the deposition of a line of tartar around the neck of a tooth is exceedingly common, this rapid destruction of the alveoli is not very common.

Abandoning, then, the theory that tartar is the primary cause, we must fall back upon the symptoms to afford some explanation of its real nature. The first thing noticeable is a thickening and rounding of the free edge of the gum; now, this is continuous with the alveolar periosteum, and the intimacy of their connection is well exemplified by that thin bright red line on the gum around a tooth, with which you are so familiar, as a trustworthy indication of inflammation of the alveolar periosteum. Moreover, at an early period the edge of the alveolus can be felt bare and rough around the neck of the tooth, so that the first point at which we are able to point to an abnormal condition is the place of fusion between the gum and alveolar periosteum, *i.e.*, the edge of the alveolus. Ultimately, the whole lining of the socket participates, but it does not do so at the outset, else the teeth would probably be raised in the sockets, and tender, which they are not, until an advanced stage.

And, indeed, the success of Dr. Riggs's treatment is just as easily explained, and, in fact, more so, on the hypothesis that the primary seat of the disease is the edge of the alveolus. The surgeon, when he gouges and scrapes a carious bone, usually effects a temporary cure, and in very many cases the disease does not recur; again, the dentist who removes a tooth, scrapes from it the diseased periosteum, and replaces it, also may succeed in remedying, temporarily at all events, the morbid and painful condition. Now, the essential feature of Dr. Riggs's operation lies in the scraping of the alveolar edge; it is in this that it differs from ordinary scaling, and it is to this most probably that its success is due: he removes the diseased portion, gives the part a fresh start, so to speak, and often effects a cure.

For a few years past I have been in the habit of treating these cases by placing small fragments of fused chloride of zinc in the pouch between the gums and the teeth; and this treatment has been followed by marked improvement, which is intelligible enough if the edge of the alveolus be the site of the disease, but perfectly inexplicable if the presence of tartar was the real source of trouble.

On the whole, then, the conclusion most in accordance with the facts is that the disease is one affecting the alveolar periosteum at the margin of the alveolus, and progressing thence downwards into the socket until ultimately the whole bony alveolus is removed. If it is taken at an early stage, both reason and some experience point to its being possible to arrest it by a removal of the part affected. At all events, Dr. Riggs's operation deserves a thorough and wide trial, and I would counsel you to practice it upon any suitable case, remembering, however, that its efficacy depends upon its being thoroughly carried out, and that this is only possible with the exercise of some endurance on the part of the patient and a great deal of patience on the part of the operator.—*Charles S. Tomes, M.A., in Monthly Review of Dental Surgery.*

TUMORS OF THE JAW.—Dr. Dolbeau (*La Tribune Médicale*, Feb. 1st, 1874) mentions that the upper jaw is the favorite seat of cysts, which are sometimes seen between the fifth and tenth years of life.

The canine fossa is the favorite position. These cysts are very slowly developed. Sometimes the two faces of the jaw swell within and without, and the cyst reveals itself under the aspect of a bilobed tumor. These cysts may enlarge, but they rarely perforate the jaw spontaneously. When they open it is because a neighboring tooth has been drawn, or they have been punctured.

Diagnosis.—The diagnosis is difficult in the first period. No sign alone is sufficient of itself; we must aid ourselves by a collection of physical and functional pieces of information, in order to arrive at certainty. If you have before you a little child which has a small depressible tumor, seated in the canine fossa, and which is apparently painless, you may at once say, "That must be a cyst of the jaw."

If we have to do with an adult, the problem, though more difficult, is not insoluble. If the swelling has but recently commenced you may be able to connect the cause with an inflamed tooth. In this case you may at once think of a subperiosteal tumor.

If the tumor be of old standing, we require further examination. Most errors in diagnosis in the disease we speak of have been made from not counting the teeth. If a tooth be absent, you may suppose that its follicle may be the cause of the tumor which you are considering.

When the disease is further advanced, diagnosis is easier; there is parchment-like crackling, fluctuation, and transparency to guide us.

As to the seat of the tumor, remember that the angle of the lower jaw often is notably thickened from the presence of a cyst developed between its laminae. If the tumor embarrass you because of the signs of solidity which accompany it, count the teeth, and you will conclude that it is a tooth, most frequently the wisdom-tooth, which is in fault. And, lastly, when we come to speak of the tumors of the maxillary sinus, we shall see how these are distinguished from those of the jaw.

The prognosis is generally good, and it is generally only the element of pain which annoys the patient, and even this is very rare; but when much time has been lost and the jaw has been invaded by the disease, our progress should be more reserved; the neighboring teeth are shaken, and the solidity of the jaw is compromised. The prognosis depends on the age of the disease and the volume of the tumor. We easily understand that if the cyst has attained enormous dimensions, the situation is unfavorable, since we are often compelled to make a resection of the jaw. The infirmity is less serious if the alveolar border alone is compromised, for the maxilla remains intact, the face is not deformed by the necessities of the operation, and an artificial plate, well made, may replace the teeth which are taken out.

The prognosis, when under the periosteum, is generally good; for such tumors compromise less the integrity of the jaw, and experience has taught us that they are always curable by an operation of a simple kind well carried out.

What is the treatment of cysts of the jaws? Here we must clearly mark out the difference between subperiosteal cysts and follicular cysts.

As to the first, we must, above all, attack the cause which has produced them, and we must extract the diseased tooth on which they depend. Sometimes this simple operation suffices to open the center of the cyst, and allow of its healing. But occasionally the cyst is isolated, and the tooth may be extracted, and yet it is not emptied. In this

case do not expect any good results from punctures to evacuate it; they are insufficient, even when followed by iodized injections; the falling in of the bony walls is difficult, and the granulation of the internal wall of the cyst may not be rapid enough to prevent the cyst from re-forming. There are, however, doubtless, cases of cure in this way related in the annals of science, but they are exceptional.

The best thing to do is to excise the bag of the cyst with the serrated forceps and scissors; that is generally sufficient to bring about a cure.

The treatment of follicular cysts has a great analogy with that of the foregoing. Punctures and irritating injections give no security of success; experience has pronounced itself even yet more categorically on this point. Do not hesitate to excise them widely.

You may sometimes see the cavity remain stationary without closing; but be patient: it will be filled up. In any case, by opening the bag you will have removed the disease, and put the bone out of danger of being affected.

These operations may be made through the mouth; but if the cyst be large and enormous, be more secure, and operate through the cheek. You will, however, not lose sight of the duty imposed on the surgeon, when operating on the face, of preserving as far as possible the features from all deforming incisions; you will separate, by an extensive but hidden incision, the cheek from the jaw, and will attack the bone, if you can, with the gouge and mallet.

Twenty years ago, in cases like this, resection of the jaw was made use of.

The disorder may be more extensive; the two laminae of the bone may be opened out; if they are out of place they must both be excised; the lower border of the jaw (if we have to do with the lower jaw) is always there to preserve for the face its harmony and solidity to the apparatus of mastication. The border itself may be implicated, when the whole of the jaw must be resected, but it is necessary then that we should be compelled by the state of the parts, for however little care be taken of the bony tissue, nature will make use of it in repairing the parts, since it is quite healthy.—*The Doctor.*

A RARE CASE OF DISLOCATION OF THE INFERIOR MAXILLARY BONE.—A female child, five years of age, was injured Sept. 27th, 1873, by falling down a steep flight of steps. An hour after the accident I examined the child, and found the following symptoms present:

There was a severe contusion on the front of the chin. The right side of the face—corresponding to the body and angle of the inferior maxillary bone—was largely swelled, though there were no external signs of contusion. The chin was somewhat retracted, and carried to the right side. The incisors were separated from one-half to three-quarters of an inch. The posterior molar teeth were in contact, though the lower teeth were displaced slightly towards the right side. The right condyloid process could be distinctly felt half an inch above the glenoid cavity, resting upon the posterior root of the zygomatic process. The lower jaw was fixed.

There was neither mobility, displacement, nor crepitus, to show a fracture of the ramus or the neck of the condyle.

Although much surprised at the condition of things, I could only

make a diagnosis of an outward and upward luxation of the temporo-maxillary articulation, with a partial fracture, or a bending of the ramus.

Reduction was effected without difficulty by applying force in a direction contrary to the direction of the displacement, the force being applied in a manner similar to that by which reduction of the usual dislocation is accomplished. As soon as the reduction was made, all the usual movements of the jaw could be readily executed, though they were attended with considerable pain.

At the present time, Nov. 16th, there is some chronic swelling over the body and angle of the jaw, and marked tenderness above and behind the glenoid cavity.

The position of the jaw—as shown by the teeth—is natural, and all the movements of the jaw are executed with facility.

It is stated, by all surgical writers, that a dislocation of the inferior maxillary bone can only occur in one direction, namely, forward into the temporal fossa; and a careful study of the anatomical relations of the parts involved inevitably leads to the conclusion that no other displacement can occur in adult life, unless complicated with fracture. Even when accompanied with fracture, Prof. Hamilton was able to find only one case on record.

The question presented in this case is, whether the diagnosis involves an apparent impossibility. In the consideration of that question, it will be borne in mind that the anatomical relations of the temporo-maxillary articulation are different in early childhood, and in adult life. The glenoid cavity is much shallower in early childhood, and the middle root of the zygomatic process which forms the outer margin of the glenoid cavity is very imperfectly developed. The condyloid process is more rounded, not having acquired the extended lateral diameter which is presented in adult life. The bones are so imperfectly ossified as to possess sufficient flexibility to allow the distance between the two condyles to be increased to a limited extent, without the occurrence of fracture.

The same cause would permit the occurrence of partial fracture (or the so-called Greenstick fracture) which would not present the usual symptoms: preternatural mobility, crepitus, etc. The coronoid process is much shorter than in adult life.

Such being the case, it will be seen that, if the jaws are widely separated, so as to bring the extremity of the coronoid process below the inferior margin of the zygomatic arch, a sharp blow upon the chin might produce the outward displacement which was observed in the case under consideration. In this case there may have been a partial fracture of the ramus or of the neck of the condyle on the right side, or there may have been merely a separation of the two rami by virtue of their elasticity. The capsular and external lateral ligaments must have been lacerated, which, however, would require but slight force, as they are both very feeble. The internal lateral ligament, being long, and attached at its inferior extremity as low as the margin of the dental foramen, would be relaxed. No impediment would be offered by any of the muscular attachments except the temporal and external pterygoid, which, if not torn, would allow only a limited amount of displacement in that direction, and would tend to produce immobility of the jaw. The distance in a right line from the condyloid process to the

last (second) molar tooth, and the distance from that tooth to the extremity of the chin, are nearly equal, and a displacement of the condyle upward, half an inch, would separate the incisors about the same distance.

Of course the relative position of the inferior maxillary bone in this case suggested the idea of a complete fracture of the neck of the condyle. That accident produces separation of the front teeth, and lateral displacement of the lower jaw toward the injured side, both of which were present in this case. A partial fracture, however, does not produce these symptoms, and a complete fracture produces also other symptoms, namely: a displacement of the lower extremity of the upper fragment, upward, inward, and forward by the action of the pterygoidus externus; a displacement of the lower fragment upward and forward by the action of the pterygoidus internus and the temporalis; a palpable separation of the fragments; a change in the line of direction of the ramus and the neck; preternatural mobility, and crepitus, neither of which existed here.

Nor in such case can coaptation be maintained after reduction without the use of retentive apparatus. In this case the condyle was plainly and unmistakably felt in the situation indicated. The reduction was readily effected, and no retentive apparatus was necessary.

While from the above considerations it is evident that the diagnosis was correct in this instance, yet it is equally evident that such an occurrence must from necessity be extremely rare. Indeed, we should infer that in the vast majority of instances the violence necessary to produce the displacement in question would rather cause extensive laceration of the soft parts, and comminution of bone.—*J. E. Tefft, M. D., in St. Louis Medical and Surgical Journal.*

CYSTIC ANTRAL TUMOR.—Mr. Gant brought forward the case of a young woman, aged twenty-nine, from whom he had excised the antrum of the upper jaw for a cystic growth. About eight years ago she felt a small lump about the size of a Spanish nut high up in the left cheek; this increased in size, and she suffered from neuralgic pains in the face. When admitted into the Royal Free Hospital the tumor presented a double swelling, partly in the cheek and partly under the lip, projecting down to the teeth. Mr. Gant then diagnosed the cystic growth in and protruding from the antrum. He made an incision from the nasal process of the jaw downwards, and carried it around the ala of the nose and through the middle line of the lip. The cheek was then readily reflected, and the tumor exposed. He then removed the whole of the antrum with cutting-pliers from the second incision to the last molar tooth, leaving the infra-orbital nerve above untouched. The incision was accurately closed with hare-lip pins. These were withdrawn on the fifth day, primary union having taken place. The patient was shown to the Society, and now, two months after the operation, can speak distinctly and eat without inconvenience, and the face presents no disfigurement. The tumor, when removed, was apparently a fibro-cystic growth.

Mr. Sewill said most of the cysts were of dentigerous origin. He exhibited some models illustrating the pathology of the cases. Removal of the offending teeth was often sufficient for the cure of these maladies.

Mr. Bryant criticised the operation as being more serious than the

disease required. He thought these cysts should be opened beneath the cheek, whether of simple or of dentigerous origin.

Mr. Brudenell Carter asked whether Mr. Gant had heard of the operation lately performed by Mr. Warrington Haward, which consisted of completely raising the whole face, which enabled the operator to remove necrosed bone from the nasal fossæ with the greatest facility.

Mr. Gant, replying, said the cyst was not dentigerous. With reference to Mr. Bryant's remarks, he would say that the disease was more a cystic growth than a cyst. He had repeatedly punctured cysts, but in this case he thought the removal of the bone itself was called for.

Mr. Bryant, after this, qualified his remarks.—*Medical Society of London Reports, in The Lancet.*

NECROSIS OF LOWER JAW.—Mr. Waren Tay exhibited a boy, aged four, in whom nearly the whole of the lower jaw, with the exception of the coronoid process and condyle of the right side, had been removed by operation, new bone having been reproduced. The patient was seen as an out-patient at the North-Eastern Children's Hospital by Dr. Cayley. He was supposed to have received some injury, although there was no evidence of it. He had diarrhœa, and typhoid fever was suspected; but bronchitis was the prominent symptom. After attending for three weeks, he improved; then ulceration of the gums over the lower jaw ensued, and he was admitted. A considerable portion of the jaw became exposed, the gum slipped away, and the teeth were picked out, some of them by himself. The jaw became dry and black, but still the patient could eat crusts, and his general health was good. At the end of five months, new bone was found to be forming underneath the necrosed portion; and when this latter seemed quite loose, it was removed. The specimen was exhibited, and comprised nearly the whole of the lower jaw. The wound healed within two weeks, and the patient now was in good health, and had fair power of mastication. Mr. Holmes, in his work on *Surgery*, refers to this condition as occurring from the influence of phosphorus in match-makers, from sucking halfpence, or resulting from cachexia, a sequel of the exanthemata. Mr. Bryant mentions two cases. Mr. Maunder stated that, about three years ago, he removed a large portion of the jaw from a girl suffering from myeloid tumor, where the periosteum was preserved, but no new bone beyond a mere thin scale was reproduced. In another case, in a female aged thirty-two, no new bone was formed, though the periosteum was preserved.—*Pathological Society of London, in British Medical Journal.*

TUMOR OF UPPER JAW, in a woman fifty-three years of age.—The disease made its appearance about ten months ago, in the roof of the mouth on the inside of the alveolar process. It gradually increased in size, involving the horizontal plate of the maxilla, but did not occlude the nostril of that side, nor was it accompanied by pain. Dr. Bigelow operated by making a curved incision through the cheek, from near the zygomatic arch to the commissure of the lips, also a vertical incision through the upper lip from the nostril of that side. The flap thus formed was reflected so as to expose the maxilla nearly to the infra-orbital foramen. He then sawed horizontally through the antrum across the front of the bone, divided the hard palate on the median line with cutting-forceps, incised the soft palate transversely behind, and

separated the maxilla from the pterygoid processes. The greater portion of the tumor (which proved to be epithelial) was comprised in this bony section. The small remaining portion, which had been sawn across, readily dropped from the upper part of the antrum which it occupied. Free hemorrhage was controlled by tying vessels as the incisions were made. The flaps were adjusted; stitches were inserted, as usual, during anæsthesia, and their ends knotted together. The wound was then left widely open until oozing should cease, and the house-surgeon directed to approximate the edges and tie the sutures together, four hours afterward. This practice has been followed in this hospital for many years as a precaution against secondary hemorrhage in most considerable operations.—*Massachusetts General Hospital Reports, in Boston Medical and Surgical Journal.*

CANCER OF UPPER JAW, in a woman fifty years of age.—Painful, and of six months' duration. It occupied the antrum of the left side, occluded the nostril, and projected from the hard palate into the mouth. Dr. Cabot made a curved incision from the commissure of the lips to a point above the zygomatic arch, and divided the upper lip vertically to a point near the inner canthus of the eye. The flap was raised, the nasal and malar processes of the superior maxilla and the hard palate were successively divided with bone-forceps. The growth, which largely involved the bone, was broken and cut away from its remaining attachments. The bleeding vessels were tied, and the wound closed with sutures.—*Massachusetts General Hospital Reports, in Boston Medical and Surgical Journal.*

A CASE OF SYPHILITIC NECROSIS AND ULCERATION.—Mr. Hutchinson brought forward a case of syphilitic necrosis and ulceration, showing the patient, and the artificial restoration of the lost parts. The disease had resulted in the destruction of the superior maxilla (save a small part in the region of the antrum), the cornea, most of the ethmoid, all the spongy bones, and also of the soft parts, including the nose, some of the cheek, the upper lip, and nearly all the soft palate. A rhinoplastic operation being deemed impracticable, the case was treated mechanically. To supply the lost parts internally an apparatus was constructed of vulcanite, bearing mineral teeth, which articulate with those of the lower jaw, and this was held in position by the vulcanite being adapted to the whole of the inner surface of the nasal fossæ, thus affording a hold by means of suction. For the sake of lightness the whole of the apparatus was hollow: the outer surface was coated with soft gutta-percha, and rested successively on the following parts: On each side, the nasal wall of the antrum and the lachrymal bones; above, on the horizontal plate of the ethmoid; behind, on the basilar process of the sphenoid and the posterior wall of the pharynx; the floor of the artificial piece formed the roof of the mouth. Mr. Hutchinson had also made an artificial nose of vulcanite. This was fixed to the man's face by an elastic band which passed round the head. The junction was partially hidden by means of a moustache fixed to the upper lip, which was also artificial. Mr. Hutchinson comments on the fact that the man's occupation (he was a mason) and his position in life compelled him to treat the case in the simplest manner possible; the various delicate improvements in the shade of color, mode of attachment, and usefulness in mastication, being only possible in the

case of persons in a higher sphere of life, who would appreciate and practice delicacy of manipulation. The patient's residence, in a remote part of Wales, precluded any but the most practical treatment, and that least likely to get out of order. He also pointed out the interesting fact that the sense of smell was present while the artificial nose was worn, but was entirely absent when it was not applied to the face.—*Reports Medical Society of London, in Medical Press.*

LARGE SALIVARY CALCULUS.—It was removed by external surgical operation, weighed 76 grains, and had as its nucleus a minute fragment of wood. It occurred in a young woman, had been growing for six years, and at times became so large as to threaten suffocation. The calculus, we should add, was closely connected with the submaxillary gland, and the diagnosis was very obscure.—*Reports Pathological Society of London, in Medical Press.*

CARE IN DIAGNOSIS.—*A correct diagnosis often makes the radical cure of apparently obscure and difficult diseases very easy.*

In order to illustrate this statement, I give a few items from my own experience :

* * * * *

An old lady thought she had catarrh in the head, which caused her, as she supposed, the intense pain in and around her eyes and through her head, from which she had suffered for some time. Occasionally the pain was so intense that she would keep her head wrapped up in blankets. She was treated by her family physician and other prominent men in the city for catarrh and supra-orbital and general neuralgia of the whole scalp.

The fact was discovered that she had several decayed and sensitive teeth, which had been more or less troublesome for some time. I urged the necessity of having the diseased teeth all removed at once, as they were in all probability the exciting cause of her severe suffering. She had a dentist extract them, and she has not suffered any since.

I could give other items of a similar character, but these are sufficient to establish the fact that a correct diagnosis often makes the radical cure of apparently obscure and difficult diseases *very easy*. If their narration here will stimulate general physicians (and specialists too) to a more thorough examination in such cases, this communication will not be in vain. Close examination lies at the foundation of correct diagnosis, the importance of which every one very well understands.—*A. D. Williams, M.D., in Cincinnati Lancet and Observer.*

A RESULT OF SNUFF-DIPPING.—Mrs. A., a lady whom I have known to be addicted to the very filthy habit of snuff-dipping, came into my office and stated that she had been suffering from a very sore mouth which her husband—who was a country physician—had told her he thought was from scurvy. It had been troubling her about five years, and would get better at times, but for the last three months had been getting worse than it had ever been. She said her husband and other physicians had cauterized the parts and given her mouth-washes, but all to no account. Upon examination of her mouth, I found the gums of the upper jaw, especially, very much inflamed and swollen, bleeding at the least touch. I at once concluded that it was all owing to the deposition of salivary calculus around the necks of the teeth, but my

instruments failed to find it. I must here admit that I was at loss to account for such an abnormal condition without the presence of some local irritant. I noticed that the gum over the outside of the right superior cuspid presented a more inflamed aspect than other parts of the mouth; I took a small scaler and passed it up under the gum at this point two or three times, and at last brought away a splinter of wood about a quarter of an inch in length; I then felt like shouting "Eureka!" Being now more interested in further investigation, I went to work, and to my great gratification succeeded in dislodging about seven more splinters from different parts of the mouth, varying in length from an eighth to a quarter of an inch. I then prepared a wash for her gums, adding the injunction that unless she abstained from the use of snuff I could promise no good results. I did not see her again for some six weeks, when she returned for more mouth-wash, stating that she had given up snuff and her mouth was nearly well. She stated that, since my operation, she had herself removed three or four splinters from her mouth with the point of the scissors. Since then I have lost trace of the case, but presume there is no more trouble or I, would have heard from it.

I presume no one who has ever lived in the Western or Southern States and is familiar with the snuff-dipping habit will ask how those splinters came there; but for the benefit of those who may never have seen such a thing as a snuff-dipper, I would state that the snuff is introduced into the mouth and rubbed across the teeth on the end of a little wooden mop about three inches long, made by chewing the end of a small stick of althea or some similar wood, until it assumes the shape of a brush. Small splinters become detached from the brush in the process of rubbing it across the face of the teeth, and insinuate themselves under the free margin of the gum, hence the trouble just recited.

—R. J. Pearson, in *Missouri Dental Journal*.

NOVEL METHOD OF EXTRACTING DECIDUOUS TEETH.—Among the many useful little articles which it is always convenient to have at hand in a dental office, is small rubber tubing, in sizes from an eighth to a fourth of an inch. The uses to which it is adapted, viz., as a means of separating teeth; holding the rubber dam on the molars or other teeth when central cavities are to be filled; as a dam, in connection with the napkin or bibulous paper when the Barnum dam is not at hand; in correcting irregularities of the dental arch, its use in various ways has suggested itself to the intelligent dentist. For this purpose it is an indispensable article with us; in fact, we feel that we might say, without fear of successful contradiction, that any irregularity of the arch, no matter how great, can be corrected by a proper use and application of these little rubber rings and the silk ligature. But we have now to record a new use for this useful little article, namely, the extraction of the deciduous teeth. Some of our readers may perhaps know from sad experience the effect of leaving a rubber ring for a day or two surrounding the neck of a tooth. If it was an incisor or canine, you had the mortification of seeing your patient return with a very sore tooth, which was gradually being drawn from its socket. We have had a little experience of this kind, and it has taught us useful lessons. We have learned from it never to leave, for a moment, a rubber ring on a tooth which we did not desire to extract, without having a ligature

passed through it to remind us of its presence. And again, if we desired to extract a deciduous molar for a timid child, the rubber ring furnished the most convenient and ready means of doing it without pain, and to the great surprise and gratification of our little patient. All we found to be necessary in the case was to slip one of these rings over the tooth, force it gently under the gum, and dismiss our patient with the injunction not to remove it. The tooth would gradually loosen and finally fall out, the rubber ring having surely, silently, and painlessly done the work of the dreaded forceps. — *E., in Missouri Dental Journal.*

DIAGNOSIS.—The importance of exhaustive scrutiny and thoroughness in the examination of teeth previous to filling was never so palpable to me as when, a few days since, I incidentally made a discovery, after it was too late, that confused me.

It was the first left superior molar that I had in hand. The teeth in front of it had been removed for the purpose of inserting a partial artificial denture. The tooth presented all the external signs of a sound and perfect living molar, in every respect, with the exception of a crown cavity and an anterior proximal one. With great care I had completed two gold fillings, and felt that I had done myself much credit. But as our most lofty exaltations are sometimes soonest and deepest prostrated, so was it in this case. By the merest incident, I discovered that something was wrong, both on the posterior proximal surface and at the margin of the gum on the palatine surface.

The tooth fit up squarely and accurately against the second molar. The eye could detect no discoloration through the enamel, or breach of continuity, and I made the discovery in attempting to examine the rear tooth. The tooth was decayed in such a manner that the shell easily gave way, revealing the fact that not only a large portion of the dentine was gone, but, to my deep chagrin, and mortification as well, the discovery was made that the tooth was necrosed and had been for some time.

But that which now seems strange and which at the time assured me, was that in burring out the front cavity, the patient, who was a healthy young lady of a little above twenty years, made the same complaint that daily occurs when cutting into sensitive dentine. When using the mallet the patient did not complain in the least, as is generally done in filling a necrosed tooth. Why was this? Was the dentine of this necrosed, tooth sensitive at the cervical margin of the cavity?—*J. C. Scott, D.D.S., in Dental Register.*

AN UNEXPECTED PROPERTY OF ADHESIVE GOLD.—Having slowly come to the conclusion that adhesive foil, sponge gold, etc., although easy to work, do not give in all cases thoroughly permanent results, I endeavored to find a satisfactory reason why one peculiar character of gold, apparently so good, should with me prove in practice distinctly worse than the old-fashioned foil with little or no adhesiveness.

Among other experiments, I applied my own tube test to different samples of gold, and the results were so strange and unexpected that I repeated them time after time with the greatest care before I could convince myself that the results were always the same and were not caused by carelessness or oversight in any way.

Taking a strong glass tube, quarter-inch bore, three-quarters inch long, I partially closed one end with the blowpipe, and in the small hole left carefully anchored an adhesive gold plug, building it up with the greatest possible care, using in some cases a Snow & Lewis mallet, and in others hand-pressure only. After making repeated trials with adhesive foil, sponge, plastic gold, annealed cylinders, and blocks, using every care, I failed totally in making one single plug tight against moisture. Pack as I would, the filling up of the vacant part of the tube with a colored solution was speedily followed by the penetration of the fluid by capillary action between the glass and the plug.

When I used soft, non-adhesive gold or tin foil, there was no difficulty, and every plug was absolutely tight. The plugs of adhesive gold were apparently a perfect fit, showing no imperfections under a powerful magnifying glass, but the unpleasant fact still remained that not one was tight enough to resist the passage of moisture down its sides, spite of attempts to wedge the plugs by the use of conical points. Whilst testing some samples of amalgam recently, I was surprised to see some plugs which were very perfect in my hands a few minutes before had become suddenly very faulty. After some experiments, I found that the heat of my hands had in a few minutes caused sufficient expansion of the glass to allow the colored solution to pass between the glass and the plug, and that a large plug in a very smooth glass tube could be made quite loose by the heat of the hand alone.

It is possible that the alternate expansion and contraction of a rigid mass of adhesive gold or amalgam may have something considerable to do with its ultimate failure where the plug is large and much exposed to contact with food at different temperatures. This cause of failure would not be likely to exist with non-adhesive foil, wedged in position, as it always will retain a certain amount of elasticity.

The question raised as to adhesive foil and sponge gold by these experiments is one of such importance that it should not be allowed to rest on the conclusions of any one operator, as the manner of working varies so greatly; and it also remains to be seen whether the process of testing in glass tubes is one which will in all cases bear out the practical results in the mouth. The reason glass was chosen is that faults may so readily be seen and the packing can be carried on in a much more perfect manner, whilst the plug and the point of the instrument can be watched closely.

Since writing the above I have attempted to make water-tight plugs of adhesive foil and sponge gold in cavities in ivory, with exactly the same results, and still not being satisfied, I gave the result of my experience to two of the best operators I know. The reply in each case was, "Oh, I will make a tight plug for you," the remark being accompanied with a "superior" smile which I fully appreciated. Neither of these tight plugs have come to hand as yet, and it is pretty evident that the failure of adhesive gold in my hands is not an exceptional case. I have now tried some seven or eight different forms of adhesive gold, with the same results invariably, and have failed with a foil after annealing which made a sound and tight plug before. When soft and adhesive gold are used alternately, the fluid penetrates to the adhesive part only, being unable to penetrate past a layer of soft foil, unless carelessly inserted.

I forgot to mention that the plugs in ivory were examined by being

sawn through, after being covered with solution for a time and afterwards dried.—*Thos. Fletcher, F.C.S., in British Journal of Dental Science.*

AN UNEXPECTED PROPERTY OF ADHESIVE GOLD.—My article on this subject last month was written with hesitation and doubts as to the possibility of error. It has, by the correspondence entailed suggesting further experiments, given me the power fully to prove the statements made, and also to call attention to other facts with regard to fillings and their failures, which have never been suspected. To those who are still inclined to doubt, I would suggest the following simple experiment, which will set their doubts at rest:

Choose a strong tooth, with an easy cavity to fill, fix it firmly in a vise, and with every possible care fill it with an adhesive gold plug. Let no pains or time be spared; and when perfectly finished and satisfactory, drop the tooth with its plug into a bottle of clear fluid ink. Allow it to remain for three or four days, take it out, dry carefully, and split it open. The ink will be found to have penetrated completely round the under-side of the plug. Try the same experiment with soft gold-foil or tin, and if the plug is made with proper care, the cavity will be perfectly white inside, without a trace of penetration.

If the testing, as to whether plugs are moisture-proof or not, is carried on with different filling materials in the same way, it will be found a matter of the most extreme difficulty to get a plug moisture-tight except in the most simple cavities; and where a cavity has two open sides, it is simply a total impossibility, except with the use of an amalgam, which has a distinct expansion whilst setting sufficient to make up for the imperfection in condensing without risk to the tooth. Believing this property of an amalgam to be an absolute necessity, I have been for a long time searching after a compound which has it, and is at the same time fairly free from discoloration, and have at last succeeded in finding one. Some preparations of precipitated silver have this property, and I believe also it will be found distinctly in palladium amalgam; but both these compounds are very strongly objectionable because of their color. The question of moisture-tight plugs has now absorbed a considerable amount of time and money, and the results (which I have no doubt will be fully proved by others) are—

1. That a moisture-tight plug is not a necessity in every mouth for the preservation of teeth for many years.

2. That the majority of plugs inserted by the best operators, under ordinary circumstances, are not perfectly moisture-proof, and that an adhesive gold plug never is so, under any possible circumstances.

3. That a plug perfectly tight against moisture is a certain protection against further decay, under any and every condition and in every mouth, and that its failure after the lapse of any number of years is an impossibility.—*Thomas Fletcher, F.C.S., in British Journal of Dental Science.*

A NEW WAY OF WORKING VULCANITE.—Mr. Caleb Williams then read a paper on a new way of working vulcanite, of which the following is an abstract:

The ordinary way of proceeding is to mount the teeth in wax; instead of this, I mount the teeth directly in the vulcanite, or, rather, I pack the rubber on the model before flasking.

The model is touched here and there with wax to make the rubber adhere to the plaster.

A piece of vulcanite is now cut to the size required, and heated on the ordinary hot-water plate, at the same time warming the model. When sufficiently hot, the vulcanite is pressed on the model with the thumb, and, as it comes in contact with the wax, melts it, and so is attached to the plaster. The superfluous rubber is then trimmed off, and a little wax is run round the edges to prevent the plaster finding its way under in flasking. The teeth are then mounted in the ordinary way as in wax, but they must be held in position while rubber is packed at the backs. After the teeth are mounted, I melt a small quantity of wax round the necks of the teeth everywhere where vulcanite adjoins the teeth or model. The vulcanite is now smoothed with a hot instrument; touch as little as possible the palate portion, so that it may retain the smooth surface.

Strengthening pieces of gold may now be added—by being made hot and pressed into position—the under-surfaces having been roughened, or the vulcanite may be thickened. It is now placed in the flask and the plaster poured in, care being taken to leave no air-holes. It is left to harden for ten minutes, and then vulcanized. You will then see that the wax has been absorbed by the plaster, and in its place is vulcanite. In this enlargement of the vulcanite lies the secret of success.

You will now see how necessary it is to exclude all air-cavities. Should there then be air-holes, the expanding power of the vulcanite is wasted in filling these, instead of taking the place of the wax, and failure is the result.

There is one disadvantage: the cases are not so easily tried in the mouth, and in taking them off the model the vulcanite sometimes sticks and takes off a scale of plaster; this may be avoided by only partially fixing the rubber until after the trying-on is finished. Some of the advantages are:

Little waste of material.

The teeth do not shift.

No danger of breaking the model or teeth by pressure.

If the model be good, a certainty of having a good fit.

Less trouble in filing and polishing.

It is much cleaner than the other way, and the piece can be left in any stage,—a great consideration for those who have to leave every now and then to attend patients.—*Proceedings of Odontological Society of Great Britain, in British Journal of Dental Science.*

POISONING FROM CORROSIVE SUBLIMATE GENERATED IN THE MOUTH FROM AMALGAM PLUGS IN THE TEETH.—Having been invited by an eminent gentleman of the medical profession to attend a convention of the State Medical Society to submit to its consideration a matter of vital importance to the human family, and being unable to comply with the invitation, I have written this article to lay the matter before the medical profession and ask its co-operation.

The matter which I wished to bring to the notice of the profession is the poisoning of thousands of people all over the world from corrosive sublimate generated in the mouth from amalgam plugs in the teeth. Neither Asiatic cholera, nor smallpox, nor any malarious disease, is doing half the mischief in the world that is being done by this poison-

ing. Every medical man of any considerable practice has undoubtedly had numerous cases of it, but never knew what it was. The symptoms are so numerous and varied in different cases that it would be impossible to give them all in this short article, but I will say that a person poisoned in this way is liable to be treated for dyspepsia, neuralgia, paralysis, consumption, and numerous throat-diseases. The patient gradually wastes away as if going into a decline, and no medicine will afford any relief. In many cases the difficulty steals on so gently as not to excite the least alarm, and continues very gradually for a number of years till the patient becomes a total wreck; while in others the attack comes on violently, and the friends and attending physician think the patient is dying; but he will again rally, and again be prostrated.

There is such a resemblance in the symptoms to nearly all the diseases to which human flesh is heir that the physician is led to treat the patient for some disease which seems to be a very clear case, but his patient gets worse. In more than twenty cases that I have had, nearly all had been pronounced by some physician as having consumption. In nearly all the cases there are at times a very bad cough, eyes sunken, and haggard expression and deep blue or dark color under the eyes, invariably a metallic taste in the mouth, water flowing from the mouth in the night while asleep so as to wet the pillow, and in most cases extreme prostration.

I have not time now to detail the manner in which the corrosive sublimate is formed in the mouth, further than to say that the quick-silver in the plugs is driven off by the heat of the mouth in very minute particles, and, combining with the chlorine in the fluids of the mouth, or any saline substance, such as our food, passes into the stomach, and produces slow poisoning. If the State Medical Society will appoint a committee to visit this place, I will show them several cases that will place the matter beyond controversy.

There are some twelve thousand dentists in the United States doing a wholesale business at this poisoning, and I ask the co-operation of the State Medical Society, as guardians of the public health, to assist in getting an act of Congress passed making it a penitentiary offense to place any poisonous substance in teeth that will injure the people.—*J. Payne, D.D.S., in Chicago Medical Journal.*

EXISTENCE OF AN ENAMEL ORGAN IN AN ARMADILLO.—In the last number (53) of the *Quarterly Journal of Microscopical Science*, a valuable paper appears from the pen of Mr. Charles S. Tomes, M.A., M.R.C.S., "On the existence of an Enamel Organ in an Armadillo" (*Tatusia peba*). After giving a lucid account of the development of teeth in general, at the same time calling attention to the unfortunate habit possessed by many authors, of copying old theories instead of recently-discovered facts into our modern anatomical text-books, he goes on to describe the result of his investigations. In his researches he employed embryos, the preparations being made by the ordinary embedding method. On examining sections so prepared, he finds a well-developed enamel organ, perfectly identical with that seen in other mammalian fœtuses of similar age, but from which enamel is not formed: this organ at an early period assumes a condition corresponding to that attained by other enamel organs after their function has

been completed; further, he states that his preparations show a persistent connection of the enamel organ with the oral epithelium; also that a second inflection of epithelium exists, which forms the enamel organ of the permanent tooth. These facts tend to prove the correctness of the view held in opposition to that of Prof. Owen by Rapps, Gervais, and Prof. Flower—viz., that some, at least, of the edentata are not monophyodont, "but possess two well-developed and functional sets of teeth." We are pleased to see that Mr. Tomes is so ably following in the footsteps of his father, who has done so much in the comparative anatomy of the teeth.—*Medical Press*.

REMEDY FOR TOOTHACHE.—Having spent a number of years of my professional life in the country, where no dentist was near, and therefore being often called to prescribe for toothache, I tried many combinations of drugs, and many published formulas, with more or less satisfaction to myself and patients. But several years since I hit upon the following combination, which I have found better than any I have ever used, and it will give relief in almost all cases where such a remedy is applicable:

R. Carbolic acid, saturated solution; hydrate of chloral, saturated solution; camphorated tinct. of opium; fluid extract of aconite, of each an ounce; oil of peppermint, $\frac{1}{2}$ oz. Mix. Apply by saturating a pledget of cotton (or preferably a small piece of sponge), and pack closely into the cavity of the decayed tooth.—*Dr. Q. C. Smith, in Pacific Medical and Surgical Journal*.

CANCERUM ORIS TREATED BY SATURATED SOLUTION OF IODINE.—Dr. J. G. Miller reports (*Kansas City Medical Journal*, August, 1873) three cases of cancrum oris successfully treated by tonics and the local application of a saturated tincture of iodine prepared by putting as much iodine into the compound tincture as it would dissolve.—*British Medical Journal*.

TINCTURE OF IODIDE OF TANNIN OF DR. BOINET.—This preparation is prepared by dissolving 50.0 parts tannin in 500.0 parts distilled water, and adding 25.0 parts tincture iodine. He uses and recommends it as a primary application for all fresh wounds, and states that by this treatment he has never observed diphtheria, and only in isolated cases pyæmia.—*American Practitioner*.

ADMINISTRATION OF ETHER.—At the Bellevue Hospital, New York, the administration of potass. bromid. gr. xxx, previous, and the same amount immediately following, or as soon as the patient can conveniently swallow, after the administration of sulphuric ether for the purpose of producing anæsthesia, is now regularly resorted to. The effect is to prevent the vomiting which so commonly follows the use of the anæsthetic.—*Medical Record*.

DISINFECTANT.—A very weak solution of permanganate of potash will destroy instantly any taint from diseased roots, imperfectly-cleaned plates, and should always be used to rinse the spittoon in hot weather every time it is made use of. It is cheap, satisfactory, almost tasteless, not poisonous, and quite free from smell. It may be satisfactory to some to know that this will remove the taint of smoking from the breath, if used as a mouth-wash.—*Practical Hints for the Laboratory and Operating-Room: Fletcher*.

SINAPISMS.—In making a mustard-plaster, use no water whatever, but mix the mustard with the white of an egg, and the result will be a plaster which will "draw" perfectly, but will not produce a blister, no matter how long it is allowed to remain upon the part.—*The Medical Brief.*

NEW FLUX FOR IMPROVING THE WORKING QUALITIES OF GOLD.—The manager of the Liverpool Assay Office, in his book on "Hall-marks and Handbook for Jewelers," strongly recommended the use of common salt as the best flux for gold under all circumstances, its value being very plainly visible when used with gold which is unsatisfactory in its working qualities.—*British Journal of Dental Science.*

COLORING PLASTER CASTS.—A delicate cream color may be given to plaster by mixing with it a little yellow ochre. A flesh-tint may be obtained by adding a little carmine red. The color of arterial blood may be obtained by the use of vermilion; of venous blood, by using vermilion and Prussian blue.—*P. T. F., in American Artisan.*

BLOWPIPE.—Take an ordinary mouth blowpipe and drill a hole through the side of the tube, then draw over this hole a thin rubber tubing and tie the ends down with silk thread. When the air is being forced through the blowpipe, a portion will issue through the aperture under the rubber and the rubber will inflate. By using the tongue as a valve while inhaling the breath, the rubber will perform the same work as the muscles of the cheeks with the ordinary blowpipe.—*T. C., in American Artisan.*

CEMENTS.—Cement sticks for holding bands and teeth in position.—A mixture of dried Canada balsam and beeswax. If the Canada balsam is soft, it should be heated until it sets hard on cooling.

Cement (thick) for fastening pivot-teeth, repairing models, etc.—A solution of gum copal in methylated ether. This will be found one of the most valuable cements for general use, and should always be kept ready for use in both laboratory and operating-room.

Cement (thin) for general purposes and varnishing models.—A solution of gum mastic in methylated spirit.

Cement, mastic (so called).—A solution of gum sandarac in spirit. The latter gum is sometimes substituted for mastic by retailers, from its cheapness. The readiest way to distinguish one from the other is to put a small piece in the mouth; sandarac remains brittle, mastic becomes tough and workable between the teeth.

Cement for surfaces which can be heated.—A small piece of mastic or shellac heated between the surfaces to be joined, which are pressed together when hot, makes a firm and water-tight joint.

Cement for rendering boxes, etc., tight against water and weak acids (for boxes containing batteries, etc.).—A solution of sealing-wax in methylated spirit.—*Practical Hints for the Laboratory and Operating-Room: Fletcher.*

WOMEN-DENTISTS IN EGYPT.—Dr. Edward Warren writes from Cairo, in Egypt, to a friend in Baltimore, that there is "a good opportunity for women-dentists in Egypt, as the women are forbidden to consult with men." There are three or four English women practicing dentistry in Cairo already, according to Dr. Warren's letter. In all

these eastern countries, there seems to be a wide field of usefulness and profit for women-doctors and dentists.—*Scientific American*.

CASE OF EMOTIONAL INSANITY.—A Western paper has this item :—It is reported that a Green Bay, Wis., dentist became emotionally insane while repairing a front tooth for a pretty woman, and kissed her. She told her husband, and he went round the next day and borrowed \$300 of the dentist—on long time.—*Medical and Surgical Reporter*.

KING'S COLLEGE (LONDON) NEW DENTAL DEPARTMENT.—No better evidence of the progress of dental science in this country could be desired than the recent creation at King's College, London, of a special dental department. By this means the dental student will be able to carry out the entire curriculum of the Royal College of Surgeons at one institution, instead of being compelled to attend both a dental and medical school.

Beyond the economy of time and labor, there is the still greater advantage to be recognized of the intimate connection that will inevitably take place between the dental and purely medical student. Such intimacy will be a more powerful agent than any other in inducing those who are entering upon their studies to take the Membership of the College of Surgeons as well as the Diploma of Dental Surgery. King's College has been one of the first, in this country, to follow in the steps of Harvard University, and we believe we are almost entirely indebted to Professor Cartwright for the promotion of such a desirable enterprise.

Seeing the disposition on the part of dental students to take the Membership of the College, it becomes every day more imperative that a preliminary examination in Arts should be made compulsory for the dental diploma, so that a student, after acquiring the L.D.S., may meet with no unnecessary difficulty in continuing his studies for the M.R.C.S. There are two means by which this regulation may be enforced : one is for the Royal College of Surgeons to make it compulsory, and the other is for the authorities at the Dental Hospital and King's College to decline to receive any students who cannot produce a Certificate in Arts from one of the bodies recognized by the "powers that be" in Lincoln's Inn Fields.

The students themselves would, we believe, be glad if this higher standard of education were made essential ; and, noting the advance that dental surgery is making as a specialty of medicine, the present time seems a suitable one for the change.—*Monthly Review of Dental Surgery*.

THE DENTAL HOSPITAL OF LONDON.—When Alexander Nasmyth, nearly forty years ago, published his admirable and exhaustive "Researches on the Development, Structure, and Diseases of the Teeth," prefaced by a most interesting and carefully-compiled historical introduction, he could hardly have presaged that the subject on which he wrote thus enthusiastically would at the present day occupy so prominent a position. But the science of dentistry has now acquired much importance, has during the past few years made rapid strides, and is, too, a branch of professional work that has for some time been properly classed as "special." We are, therefore, glad at the beginning of a new year to know that the Dental Hospital of London is about to acquire a new lease of life, a great increase of vigor as a school, and an extended

sphere of usefulness as a charitable institution, by the removal of the present establishment to a building in all respects suitable for the work.
—*The Lancet.*

TURPIN'S RUBBER.—The editor of the *British Journal of Dental Science* having expressed a desire to know my opinion respecting the rubber supplied by Mr. Turpin, of Paris, I may say that I consider it superior to any that has yet been introduced, excepting, perhaps, the earlier specimens supplied by Putnam. When filed with any other than a very coarse file, it leaves a polished surface very similar to that of a hippopotamus tusk when so treated. The pink and white appear much denser than any other samples of these colors supplied elsewhere, and their colors are certainly superior to any I have yet seen. With regard to brittleness, I have made no comparative experiments that would enable me to offer an opinion either way, but, from their hardness, can safely infer that they are not nearly so likely to wear away from the pins of teeth, and thus cause their falling off, as is the case with rubber generally in use. I am informed that a little more care must be exercised in their manipulation, but that is soon acquired.—*Alfred Coleman, Esq., in British Journal of Dental Science.*

THE MORRISON ENGINE INFRINGEMENT.—The indications are, just now, that there will be "quite a stir in the dental profession ere long in reference to the Morrison Engine." It is claimed that this very popular appliance is an infringement upon a patent issued in 1866 for a machine devised and constructed for running sheep-shears.

This machine appears to possess all the principles of the Morrison Engine, except the hand-piece, and undoubtedly by the date of its patent has precedence. Why does the Patent Department issue two patents for the same thing, or for two machines involving the same principle?

A demand is now made upon all who are now using the engine that a license be obtained from the original patentee for each and every engine in use; the charge for which is \$25.

We do not propose to give advice in this matter; but we will not take out a license, nor pay the fee, for the present, at least.

If the patentee or the manufacturers of the Morrison Engine had any knowledge of this former patent, they did great injustice to themselves and to the profession by introducing that which would cause trouble, perhaps litigation, and hard feeling. But, if they had no such knowledge then, they now have, and they should proceed at once to make such arrangements with the owner of the former patent as will protect all those who are using, or may use, the Morrison Engine. This is justice; this much, and not less, in this matter we ask.—*Editorial in Dental Register.*

HINTS AND QUERIES.

WHAT percentage of the people do we, as a profession, reach with such operations as tend to preserve their teeth? We hope to hear from a goodly number of the profession upon this subject, as such statistics are valuable. Parties answering this query will please give their address.—S. J. COBB, *Nashville, Tenn.*

ANCIENT DENTISTRY.—In the last paragraph of the communication under this heading published in the February *Cosmos*, please read instead of "some of the above charges" some of the above *items*, and oblige
GEO. H. CHANCE.

WOOD-FILLING FOR NERVE-CANALS.—Under the head of Hints and Queries in the February number of the *DENTAL COSMOS*, a writer makes mention of filling root-canals with wood saturated with creasote, and describes it as *new*, when the facts are that it is at least *thirty years old*, and was described by Harris in one of the old editions of his "Principles and Practice." Again, in the published transactions of the American Dental Association for 1868, Dr. F. Y. Clark mentions the use of wood for filling root-canals as a *perfect method*, so it is not *new* by any means.—A. W. HURLAN.

A CASE IN PRACTICE.—The following came under notice three days back; it tells its own story:

Last May (1878), an arsenical application, covered with cotton and sandarac, was made to a lower molar for a young lady, aged fifteen. She was going to the country for two or three weeks, and was instructed to call first thing on her return. Having obtained relief from pain, however, and dreading the thought of any further manipulation, she omitted to present herself, and allowed the dressing to remain until discovered by myself on February 21st, 1874. To all appearance the cotton was as good as the day it went in; the outer dressing being removed, the inner portion, bearing the arsenical paste, was found quite dry and sweet, and the pulp, though exceedingly friable and rotten, was still dry, and gave no indication of decomposition, being removed with very little trouble, though in several pieces.

Perhaps a case like this affords the true explanation of some others which we meet with occasionally, where patients walk off with an arsenical application, and fail to turn up at the appointed time. It is suggestive, moreover, to the timorous souls who now and then alarm themselves by talking about "absorption of the arsenic through the pulp into the system," and all manner of dreadful things.

It is unnecessary to explain the reason for adopting devitalization in the above instance; probably the day may come when a man will have to give a *very good* reason for such practice, but, before it does, people must learn the value of frequent inspection, and give up the silly habit of keeping away from the dentist's house until they can keep away no longer.

On this side the water we are a long distance behind such a condition of things as yet.—W. H. WAITE, *Liverpool*.

THIRD DENTITION.—In looking over the *Cosmos* for July, 1872, I notice that Dr. Bernard Hess doubts there being any authentic case of third dentition, and considers all such *apparent* cases to be cases of oversight. In January, 1872, I extracted all the superior teeth, among which were *both right and left canines*, then remaining in the mouth of Mrs. M., a lady about thirty-five years old. Absorption of the alveolus progressed rapidly and uniformly, and in a few months I inserted an upper denture, which she wore with comfort until September of the following year, when she came into the office, complaining that I had missed a root at the time of extraction, and wished to have it removed, as it was giving her some trouble. Upon examination, I found, at a point opposite the first bicuspid of the lower jaw and *inside* the alveolar ridge on the right side, an opening from which protruded what appeared to be a small root. Examining with a probe, I found imbedded in the gum a fully developed crown, and, after

opening the gum sufficiently with a lance, applied the forceps and extracted a perfectly developed canine. The tooth was placed in the jaw at an angle of about forty-five degrees, the crown pointing forward.—LUTHER G. KIMBALL, *Bridgeton, Maine.*

DR. J. E. GARRETSON relates the account of a case of cystic tumor of the cheek, operated on by Prof. Agnew and himself, where the growth had attained the size of an ordinary egg in four months. On removal, the cyst, which had appeared to be free in the substance of the cheek, was found to have formed attachments to the supra-antral periosteum, and as the result of the pressure had caused such thinning of the wall of the cavity as to convex the whole face of the bone into the sinus. The contents were found to be a straw-colored fluid, having more or less flocculi floating in it. The cyst, when collapsed, was of very limited dimensions; superficially the attachments are noted as being very loose and cellular.—W.

THE TREATMENT OF CHILDREN'S TEETH.—I regard this as the most important field in the profession of dentistry, because, if this field is cultured as it is capable of being done, it will do much towards solving the problem of prevention of the decay of the teeth. The subject of prevention was *emphasized* by Dr. Lord at the last meeting of the First District Dental Society, and it *ought* to be so emphasized all along the line. Every one who has had any degree of earnestness upon this subject knows how susceptible children are to *right* direction. They are earnest listeners, and can be easily coaxed into our confidence without *deceit*, and make the most interesting class of patients we have. With their confidence, we can do for them *anything* that is *necessary* to be done. I am quite sure that one of the great mistakes we make is, we try to do too much. The dentist that instructs his little folks *much* with the forceps does not win their interest in him very rapidly. With the facilities of the present time, I see no valid excuse for neglect in all reasonable efforts to make such operations on the teeth of children as will secure them, in a large majority of cases, to them through the term of their required usefulness.

Frequency of visitation to the doctor's is a subject that *we* should euphonize constantly in the ears of the little ones and their guardians, or else we will not meet with the success that is possible. *We can win* the love of children in our offices, in spite of the frightful reports that may have been poured into their ears before meeting with us. And when we have secured their interest in us, then the subject of cleanliness must be assiduously impressed upon their minds; they must be taught the advantages of establishing the habit in early life, and that it will help as much to save their teeth as what we can do. And here, gentlemen, I ask, is there not a fact that cannot be denied,—that, let us be as faithful as we may, does not our success largely depend on faithfulness in cleanliness of the teeth? Cutting, filing, polishing, filling, regulating, and healing necrosed tissue must be carefully done, and then turned over to the care of the patient. Other methods can be profitably discussed besides the methods of care in cleaning. But must we not acknowledge that our hopes must rest firmly on this one point? With the helps we now have in the dental engines, clamps, and rubber dam, I can accomplish the operations I see the necessity of making with greater facility and more hope of success than once without them. For filling deciduous teeth, I think, as a rule, we can do all that is required of us with the plastic materials and tin foils. The development of the good teeth or permanent ones, so-called, and the character of their organization, would indicate to me what

kind of material I would fill with. The subject of regulating children's teeth is one that calls louder and louder for *real* ability to cope with the multitude of cases that come under the notice of us all, as you know a great many attempts are made in this direction that prove utter failures, much to the discomfiture of both patient and operator,—not unfrequently, by the unfaithfulness of the patient, and *vice-versa*. We here must complain that often patients do not second our efforts. I think it true that those who are eminently successful in these cases have a way by which they secure the co-operation of the patients, and this I think is true in all other departments of our specialty. Knowledge always inspires confidence in proportion to its advancement in the direction in which it is applied.—G. A. MILLS.

ABOUT CELLULOID AND CHEAP METAL BASES.—Some, I see, seem to have much trouble in working the celluloid plates. I have had some trouble working it where I wished to use gum teeth. About two years and a half since I commenced to use the celluloid for dental plates; have always bought in small quantities, and the second or third lot which I bought proved entirely worthless. It was flaky and soft, and if that had been my first lot, perhaps it would have been the last; but I had used some that was better, and I ordered another lot, and have continued to buy and use it ever since, though in the time have had other soft and imperfect plates. In the first lot of celluloid I bought I had one uncolored plate. On this I put up for a lady a temporary upper set of teeth. She wore them three months with satisfaction, but the plate became loose from absorption of the alveolus, and she wanted something done for them. I took a new impression, and reset the teeth on the same plate, which was worn from that time more than a year, and was as good to all appearance as a vulcanite plate after a year's wear; but the color was changed, at the time of the second setting of the teeth, to a dirty-looking white. It is the only uncolored plate I have used, and the only plate I have seen discolored by working or wearing, more than what we often see on the palatine portion of vulcanite plates. I have patients wearing celluloid plates now two years and over, and they show no signs of shedding their teeth nor warping out of the mouth, and do not break as easily as vulcanite. Have had two partial plates warp so they did not fit good in the mouth, which I think was because I made them too thin; and I think if they had been whole plates, with all the teeth on, they would not have warped. Had trouble for a time with springing and cracking of plaster models, but at the suggestion of Dr. Cook, of Iowa City, I came to use models of zinc, cast in same as I would cast a male model to swage a metal plate, and have had no trouble in that way since. I burned two or three plates while heating in oil, owing probably to imperfect working of my thermometer, and have long since left the oil, and use nothing but water, which softens the plate just as well, and is safer and cleaner. (Perhaps the new steam process is better.) I find it quite important to have just enough celluloid in the flask to fill the mould, and for that reason, when I open my flask to remove the wax plate, I remove all the wax as nearly complete as possible, and place it again upon the male model, with all the wax as near in the same position as when in the mould as I can; oil it over. Set on another upper flask or ring, and fill with plaster, and when sufficiently hard, open the flask, remove the wax, cut my celluloid to near the amount wanted to fill the mould, put it in the flask, put the flask in the clamp, and set it in a pot of boiling water, and cover close. When it has been in a short time, and the water boils out thoroughly, commence to screw the clamps down a little at a time, until the two

parts of the flask come together. I then set my clamp and flask into a pail of cold water until sufficiently cool, then remove the ring and plaster investment, and, if any plaster adheres to the plate, clean it away, and cut away the surplus celluloid that has been forced into the waste gates, leaving the plate upon the male model. I then place the female model, with the teeth in position, in the clamp with the male model, with the plate in position, and go through with the same process of heating and cooling, leaving it in the heater several minutes after the flask is closed, then keeping it in the cooler until entirely cold before removing from the flask. I then cut away the female model, lest I break some of the teeth in prying the flask open. This course of procedure I consider indispensable, especially when I use gum teeth. There is no shrinkage of celluloid sufficient to break the gums; when I find the gums broken, I am certain it was done while screwing down the clamp. The celluloid, as we get it now, makes a much stronger and more dense plate than when I commenced to use it.

My rubber license expired with the year eighteen hundred and sixty-nine, since which time I have not used vulcanite for plates, for which reason Bacon & Co. bring suit against me. Have worked nearly all the cast bases, and find none of value for upper plates except aluminum, which makes a very nice strong plate, and very light. I have cast them with success in a common flask, as I would any other cast base, but prefer to swage the plate, and attach the teeth by a casting process, with an alloy of tin and silver, which alloy makes a good plate for under-sets of teeth. In putting up a set of teeth on aluminum, when I get my plate swaged and finished up I drill and countersink as many holes in it as I think it will require pins to hold the teeth upon it,—about fourteen, a little larger than those used in the best teeth; then put the plate upon a model, and set the teeth up with wax, filling every place I want filled with metal when done, and using no more wax than is really necessary to make the job smooth. I then remove the plate and teeth from the model; take of sand one part and plaster two parts, mix to the proper consistency, and fill the bottom of the flask, also fill the palatine side of the plate with the same, and set it in the flask while yet soft, and the teeth are in the same position at this time that they would be if they were set up for a vulcanite plate. I then proceed the same as for vulcanite work (filling up the flask with the sand and plaster mixture), until I open the flask and remove the wax. In opening the flask the plate should remain upon the new male model formed of the sand and plaster in the bottom of the flask. I then take scraps of aluminum which have been cut away in rounding up the plate, and with a hammer form them into rivets, with a head upon one end, and drive them through the holes in the plate, firm enough to remain until the casting is done, and in such position that they will not press upon the teeth nor plaster in the female model when the two parts of the flask are clamped together; then cut the gates in the plaster to receive the metal and vent the gas, and, when thoroughly dry, bind the two parts of the flask together either with the clamp or screws, and it is ready to heat up for casting, which may be done over the kerosene stove or in any other convenient way; and when sufficiently hot for a piece of metal to melt lying upon the flask, the casting may be done with safety. I have patients wearing plates of this kind more than three years, with success and satisfaction.—G. W. MATTESON, M.D., *Middleville, Mich.*

A FRIEND in Japan, interested in the progress of dentistry, has sent us the following sketch, as the substance of the discussion at the last annual meeting of the Royal Jaw-Twisters of Nippon.

This learned association has existed for centuries, and numbers among its members the principal scientists of that progressive country.

Prof. Yankamolar presided. He stated that as the object of the association was the advancement of their noble science, which already stood at the head of all others, and included all others, it was not expected that gentlemen would talk about what they might happen to know, or were prepared to illustrate or prove, as it was desirable that scientific discussion should not be confined to so narrow a basis. Science is illimitable,—the whole boundless universe is ours,—to be confined to common sense and matters of fact is degrading. Our minds must flow out into the unknown and infinite. We must go down to the beginning of things. We must be bold as Satan in our soundings into chaos, and strive to bring up to the light, at least some fragment of the bridge once made for him to the borders of a new creation.

Another point was perhaps worth mentioning. The technology of science is limited and unsettled; let no one hesitate to empty his calabash because he may not be able to define the gurglings made by its mouth. Words must be invented first, meaning comes afterwards. Let us not strangle our inspirations because they may sound like the babblings of fools. The foolishness of to-day often becomes the wisdom of to-morrow.

He was pleased that a special order of the emperor had allowed the publication of their proceedings without naming the gentlemen who took part in them. The reporter would give simply the speaker's number in connection with his remarks. Science was impersonal. He was inclined to believe that modesty, and fear of seeing their names printed, had kept many silent who might otherwise have enlightened the world.

He was glad to see translations of the proceedings of American societies among them. The Yankees were young and ignorant, but progressive; they had aspirations that gave an impetus and originality to their work, that in a few centuries might make them worthy of fellowship with the great jaw-twisters of Nippon.

The president's address was listened to with great attention, and applauded.

No. 1 proposed a vote of thanks, and that another letter be appended to his title; but on being reminded that the whole alphabet had already been appropriated to that end, he suggested that his name be enrolled among the gods, which was unanimously agreed to.

No. 2 presented to the society a tooth found in an excavation in the very heart of a mountain, where no animal could ever come. Evidently the result of crystallization. This suggested the true theory of animal creation. He had no doubt that in the bowels of the earth there were many mines of teeth, the necessary result of crystallization working upon the atoms of the mineral life-substance. And why should these things remain idle? uselessness is inconsistent with the primal idea of matter. Hence the thought of making the tooth subserve some purpose. It is well adapted to grinding, and therefore the animal was thrown around it, with all its more or less complicated organs, in order that the tooth might grind food for its subsistence.

No. 3 thought the idea one that might lead to great results, and believed it was corroborated by the fact that in some countries men and women wore natural crystals as ornaments about their persons.

No. 4 begged to call the attention of the society to an improved way of filling the roots of dead teeth. It was well known that it was impossible to do this perfectly by any of the old methods, on account of the tortuous canaliculous vacuity produced by the unequal impaction of the dentinal fibers into space. His

system was to bore down to the end of the root through the gum and jaw, and to force some gas into the root under the pressure of a sufficient number of atmospheres to make it solid. He then extracted the tooth, plugged up the orifice at the end of the root so that the gas could not escape, and replaced the tooth. He had never known a case to fail.

No. 5 read a paper on the decline and fall of modern teeth, in which he deplored the efforts too many, who ought to know better, are making to prevent the loss of these organs, or restore to growing generations their strength and hardness. He argued that nature knows best about these things; and the fact that the teeth of man are failing, simply proves that they will not be wanted much longer,—that man is preparing for a change in which coarse food, and consequently the necessity of mastication, will pass away. This deterioration is one of the most powerful arguments for our transformation into some higher type. This higher existence is typified in the pure and innocent infant born without teeth.

No. 6 thought this view would tend to the extraction of teeth in order to encourage and favor the aspirations of nature, without any local reason for their removal. He was opposed to this practice; at least he never extracted teeth that were diseased and loosened so as to be on the point of falling out, until, using the tooth as a nucleus, he had completed the building-up of a new socket; when, if necessary, the tooth might be extracted without the loss of that form and beauty that nature had given to the human face divine.

No. 7 remarked that these theories suggested to him great thoughts. He felt invigorated and encouraged in his arduous work; and he wished all to join him in a petition to the Mikado, that it might be made a capital offense for any but members of their society to permit themselves to be addressed with the title of Doctor. It had become urgently necessary that something should be done to elevate the standard of their profession, and give it character and respectability; to draw a line between the pretentious and ignorant, and those who had devoted their lives to humanity and the development of science.

No. 8 wished that the cause of tooth-decay might be discussed. He had an instrument of such power as to show the animalcules at work in all parts of the body. He doubted the propriety of calling them parasites. He had discovered that these were the real powers of vitality; that they floated in the blood, carrying the elements of nutrition to all parts of the body, and returning in ballast with refuse material. If any element was lacking in the blood, they sought for it where it could best be spared, and carried it off to more vital organs. Thus, if lime were deficient, these little workers ran up into the tubules of the teeth, which are the most unimportant organs of the body containing lime, and carried away load after load, until its structure was broken down and a cavity formed. Now, if this be the true theory of tooth-decay, what was the scientific remedy? The one he had adopted, after much thought, and that had proved eminently successful, was to recommend the carrying of a little plaster of Paris in a pocket of some garment next the skin. He believed that the membrane of the pocket, through the medium of invisible perspiration, was capable of endosmotic action, by which the lime was carried gradually into the circulation. In very bad cases he preferred quicklime, as being capable of more rapid action.

After voting thanks to the emperor for having, in the interests of science, gratuitously placed at their service the royal coaches, to convey them to and from their homes, the association with mutual congratulations adjourned.—*San Francisco, Cal.*

THE DENTAL COSMOS.

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No. 5.

ORIGINAL COMMUNICATIONS.

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 179.)

THE NOSE.

I.

THE nose has been divided conveniently into the nose proper, or *external nose*, and the internal nose, or *nasal chamber*.

Analogy would suggest that the external nose holds to the nasal chambers the same relation the external ear holds to the middle ear. In the case of the ear, the mucous and labyrinthian divisions are separate; but in the nasal chambers they are commingled. Were we to reserve the term *vestibule* to the external apparatus of each, and to the remaining portion the title of the *essential chamber*, the analogy between the external nose and the auricle for a *vestibule*, and the nasal chambers and the *middle ear* (plus the *labyrinth*) for an essential chamber, would be complete.

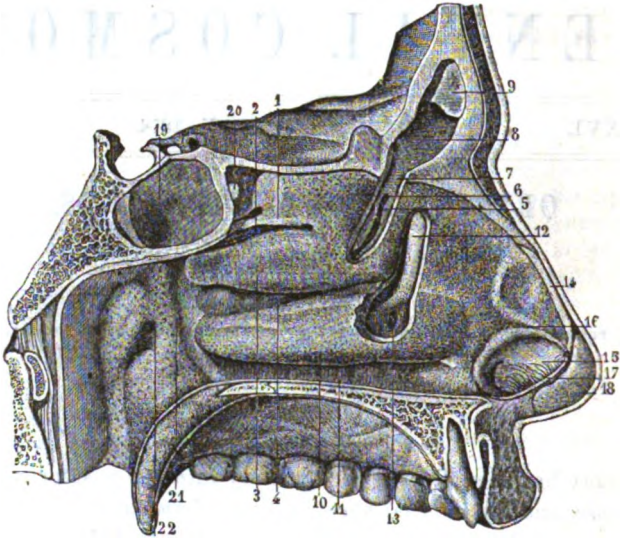
The external nose is a rudimentary proboscis. It has nerves of common sensation only. At the same time it is not so much a true integer to the face as an organ intimately associated with it. The man who invented the phrase that a certain thing "is as plain as the nose on one's face," evidently was no anatomist. He unconsciously accepted a very intricate form as a type of a simple proposition.

The nose is a strictly symmetrical organ, a fact apparently overlooked by the student. The ethmoid bone is a union of two distinct sense capsules, as would be a bone which would unite the petrous portions of both temporal bones.

The Nasal Chambers.—These are, from what has preceded, two in number, a right and left, with a portion of the ethmoid bone presenting in each. It is evident that that portion of the nasal chamber presided over by the ethmoid must have an *olfactory significance*. It is far dif-

ferent, however, with the *turbinated bone*, which is not supplied by filaments of the olfactory nerve, and which is directly within the respi-

FIG. 25.—OUTER WALL OF THE LEFT NASAL CAVITY.



1, superior turbinate process; 2, superior meatus; 3, inferior turbinate process; 4, middle meatus; 5, portion of the turbinated processes of the ethmoid bone, removed to exhibit the orifice of communication; 6, with the anterior ethmoidal sinuses; 7, communication with the frontal sinus; 8, left frontal sinus; 9, part of the unsymmetrical partition which separates the frontal sinuses; 10, turbinated bone; 11, inferior meatus; 12, lachrymo-nasal duct exposed by removing a portion of the bones; 13, its termination; 14, edge of the upper lateral cartilage; 15, outer part of the left nostril; 17, cut edge of the cartilage of the partition; 18, inner portion of the left lower lateral cartilage; 19, sphenoidal sinus; 20, its orifice; 21, pharynx; 22, orifice of the Eustachian tube.

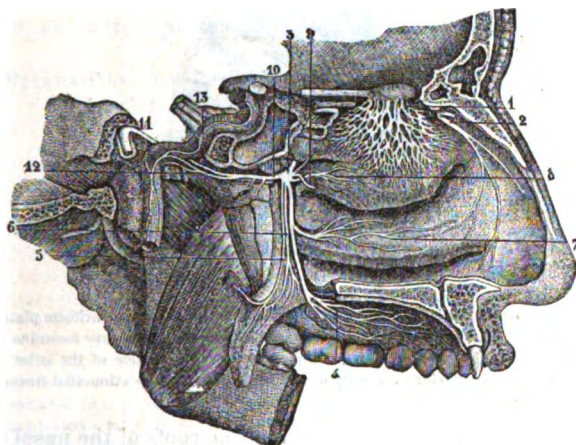
ratory tract. An arrow placed vertically upon the surface of the ethmoid bone in the nasal chamber will indicate the position of the *olfactory* division of the nose; a second placed horizontally below the turbinated will represent the *respiratory* division; and a third placed in the axis of the plane of the nostril will represent the *vestibule*. It will be observed that the vestibule is supplied by the nasal branch of the ophthalmic nerve; the olfactory by its own special nerve; while both the olfactory and respiratory divisions receive common sensation from branches of the superior maxillary and the ganglion of Meckel. (Fig. 26.)

We will first treat of the olfactory and respiratory divisions, and describe the bones entering into them.

The Ethmoid Bone.—The ethmoid bone is situated for the most part in the face. It is held within the ethmoid notch of the frontal bone by its superficial surface only. The bone is of papyraceous consistence,—

being compact only where the uncinat process arises in common with the nasal lamella anteriorly. It is composed of a *vertical* and a *horizontal plate* and the *lateral masses*.

FIG. 26.—VIEW OF THE SPHENO-PALATINE GANGLION, THE OUTER WALL OF THE LEFT NASAL CAVITY, AND THE OLFACTORY NERVE.



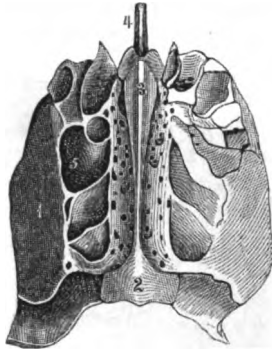
1, olfactory nerve; 2, nasal branch of the ophthalmic nerve; 3, sphenopalatine ganglion; 4, 5, 6, palatine nerves; 7, branch of the nose; 8, nasal nerve to the outer wall of the nose; 9, do. to the inner wall; 10, pterygoid nerve; 11, facial nerve; 12, deep petrosal nerve joining the carotid plexus; 13, the other branch of the pterygoid is the larger petrosal nerve, which joins the facial.

The vertical plate is a thin lamina of bone extending downward in the median line from the horizontal plate to form the upper third of the nasal septum. Its anterior boundary is inclined forward, and articulates with the nasal spine of the frontal and the crest of the nasal bones. The posterior joins the sphenoidal crest of the sphenoid bone; the inferior presents a border which is angulated at its posterior third. The portion sloping upward and forward, in front of the angle, articulates with the triangular cartilage of the nose, that behind inclining upward and backward to join the vomer. The sides of the vertical plate are grooved for the reception of filaments of the olfactory nerve. The vertical plate projects beyond the horizontal plate to appear within the brain-case. It is here termed the *crista galli*. Seen from above it appears to arise from the middle of the horizontal plate. It is a robust, angulated ridge, whose anterior border is nearly vertical, and provided at its base with two lateral flanges, the ethmoidal alæ. Immediately in front of this surface is the foramen cæcum. The posterior border is more sloped. The *crista galli* is designed for the insertion of the great longitudinal falx: it is occasionally hollow.

The Horizontal Plate.—The *crista galli*, already mentioned, lies upon

the horizontal plate at the extremity of the vertical lamella. On either side of it are seen the cribriform plates, which are transverse septa, consti-

FIG. 27.—UPPER VIEW OF THE ETHMOID BONE.



1, orbital surface of the lateral mass; 2, posterior extremity of the cribriform plate, which unites the lateral masses, and is depressed and perforated with numerous foramina on each side of the ethmoidal crest 3; the two oblique processes in advance of the latter are the ethmoidal wings; 4, anterior extremity of the nasal plate; 5, the ethmoidal sinuses.

tuting the floor of the cerebral fossa and the roofs of the nasal chambers. They are sometimes termed the olfactory grooves. Each groove is perforated by three rows of openings, the middle of which are simple perforations of the roof of the nasal chambers of its own side, while the inner and outer are the openings of minute canals which lie upon the vertical lamina, and the nasal side of the lateral mass. At the anterior part of each olfactory groove a slit is seen for the escape of the nasal branch of the ophthalmic nerve into the nose.

The Lateral Masses.—These are two in number, one on either side of the vertical lamina. Each lateral mass is of a cuboidal figure, to the inner border of which is attached the olfactory groove, thus uniting it to the vertical lamina.

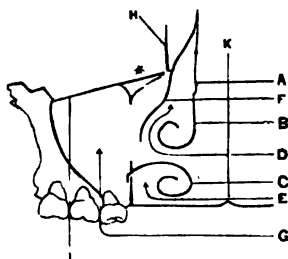
It presents three divisions: the *nasal*, *uncinate*, and *orbital*.

The *nasal* may be said to descend from the horizontal plate, where it is grooved for filaments of the olfactory nerve. It defines the inner aspect of the lateral mass its entire length, and constitutes the upper two-thirds of the outer wall of the nasal chamber. Anteriorly it forms an attachment to the frontal bone at the outer side of the frontal spine. Thence it passes downward a little outward and forward, to lie in contact with the nasal aspect of the ascending process of the superior maxilla. It is imperfectly divided by a narrow sulcus (the superior meatus) into two portions. The superior meatus is, as a rule, continuous with the sphenoidal margin of the bone which it deeply notches. The space above this meatus and its overhanging, curved border is termed the superior turbinated process. It articulates posteriorly with the sphenoidal

crest. That below it is termed the middle turbinated process, and articulates with the palatal bone at its upper crest.

Arising from the anterior margin of the nasal plate is the *uncinate lamina*, commonly called the uncinat process, or the process of Blumenbach. This is a thin extension of bone backward and outward. Often scythe-shaped, it may be irregularly square. It lies to the inner side of the ascending process of the superior maxilla, which it may

FIG. 28.—DIAGRAM OF THE RELATION OF THE SUPERIOR MAXILLA AND THE INTERNAL NASAL CHAMBER.



A, B, the nasal lamella of the ethmoid bone. A, the superior turbinated scroll. E, the middle turbinated scroll. G, the inferior turbinated bone. D, the middle meatus, leading upward to the space between the uncinat process and the nasal lamella of the ethmoid bone. K, the inferior meatus. F, the uncinat process of the ethmoid bone. G, the maxillary sinus. H, the os planum of the ethmoid bone. I, the orbital plate of the superior maxilla. K, the nasal septum. *, the portion of the orbital plate lying to the inner side of the opening of the maxillary sinus.

touch. It thence passes behind the lachrymal bone, where it sends a small process downward, to articulate with the lachrymal process of the turbinated bone. The uncinat process terminates in an irregular margin, which aids in closing the large orifice of the maxillary sinus. It articulates in part with the ethmoidal process of the turbinated bone, and in part, at times, with the superior maxilla. This process is of much greater importance than the student may imagine. He should remember its position and its use in strengthening the inner wall of the maxillary sinus. When the rarity of cystic distension inward of the sinus, and the great frequency of deflection of the nasal septum under slight pressure, are considered, it will be seen that the uncinat process is structurally the stronger of the two.

The *orbital division* of the lateral mass is connected to the nasal surface by transverse septa, but is occasionally free. It is cellular, and divided into an anterior and a posterior set of cells. It presents an inner surface, just mentioned, an outer surface (os planum), smooth and quadrangular, which is exposed within the orbit. It lies between the lachrymal bone in front, the orbital process of the palatal behind, the frontal above, and the orbital plate of the superior maxilla below. The *upper* surface of the orbital portion is imperfect, and is covered in

by the frontal bone. The hinder surface is continuous with the sphenoidal turbinates and the palatino-maxillary cells. It communicates with the posterior group of cells through the superior meatus. The *anterior* surface is narrower, and, by removing the lachrymal bone, observed in part to terminate upon the root of the uncinatè process, and is in part continuous with the frontal sinus and the anterior ethmoid cells.

FIG. 29.—EXTERNAL VIEW OF THE RIGHT TURBINATED BONE.



1, anterior extremity articulating with the superior maxillary bone; 2, posterior extremity articulating with the palate bone; 3, hook-like plate overhanging the lower border of the maxillary sinus. The process in advance of it above joins the lachrymal bone to contribute in the formation of the lachrymo-nasal duct. 4, inferior, obtuse border.

The Turbinated Bone.—The turbinated bone is an elongated scroll of bone appended by its outer border to the inner wall of the maxillary sinus, and to the lower crest of the palatal bone. It consists of a body and three processes, the *maxillary*, the *lachrymal*, and the *ethmoidal*. Its inner border, at its anterior edge, is fixed to the inferior crest of the nasal process of the superior maxilla. The bone is curved from within outward, presenting a convexity toward the nasal chamber, grooved for vessels and nerves. The entire bone is of papery consistency, and marked by minute depressions and elevations for the retention of the mucous membrane.

The *maxillary* process is a hook-like process of a hemicircular shape. Hence its name, sometimes given it, of the auricular process. It is applied to the inner wall of the maxillary sinus, and serves to maintain the bone in position. The *lachrymal* process passes upward and forward to articulate with the inner portion of the lachrymal bone. The *ethmoidal* process arises in the same plane a little farther back, to effect a junction with the uncinatè process of the ethmoid bone. The lachrymal and ethmoidal processes aid in defining the nasal wall of the maxillary sinus.

The Vomer.—The vomer is a thin, rhomboid lamina of bone, having its upper and lower borders nearly horizontal; the anterior part sloping from above downward and forward, extending from the median line of the body of the sphenoid bone to the hard palate from above along its entire length. Its lower margin is, therefore, longer than the upper. Its sphenoidal surface is furnished with a V-shaped depression, with stoutish, everted lips for the insertion of the rostrum. The lateral edge of the lip unites with the sphenoidal process of the palatal bone. Its

palatal surface is broad and even anteriorly, sharp and thin posteriorly, for articulation with the crests of the superior maxillæ and the palatal bones. Its *ethmoidal* surface is grooved for the reception of the vertical

FIG. 30.—LEFT SIDE OF THE VOMER.



1, 1, broad groove receiving the rostrum of the sphenoid bone; 2, 2, inferior border articulating with the palate plates of the superior maxillary and palate bone; 3, posterior border, the dividing line of the posterior nares; 4, 4, grooved border receiving a narrow slip of cartilage, situated between the vomer and the nasal plate of the ethmoid bone; 5, 5, border for the cartilaginous septum of the nose; 6, 6, nasal surface.

plate of the ethmoid bone. In advance of the ethmoid surface is a thin, compressed margin for union with the septal cartilage. The posterior surface is free. The sides of the vomer are smooth, save where they are grooved for the naso-palatine vessels and nerves. The sides of the alæ are marked by a ridge of minute points, which serve to limit the plane of the posterior nares superiorly. The vomer is composed of two layers which slightly diverge at the anterior border. A thin rod of cartilage, continuous with the cartilage of the septum, is, as a rule, found in the space between the two vomerine layers.

In reviewing the osseous frame-work of the nasal chamber, excluding that portion pertaining to the vestibule, we find that one-half of the cribriform plate of the ethmoid bone constitutes the *roof* of the chamber, aided by the sphenoidal turbinated bones; that the vertical plate of the ethmoid bone and vomer constitutes the *inner* wall; the palatal plates of the superior maxilla and the palatal bone the *floor*, and the nasal lamella of the ethmoid bone, and the convex surface of the turbinated bone, its *outer* wall. We have already said that the sulcus on the nasal lamella of the ethmoid bone is called the *superior meatus*; that between the lamella and the turbinated bone, the *middle meatus*; while the space between the turbinated and the floor of the nose is the *inferior meatus*.

It is a noticeable fact that the mucus of the frontal, maxillary and sphenoidal sinuses, as well as the tears, flow into the nasal chamber in such a way as to be diverted downward and backward. The constant seeping of mucus over the turbinated scrolls tends to bring the fluid towards the pharynx, in which it is lost. But while the sense of smell requires the olfactory area to be constantly bathed in moisture, an excess of fluid would be destructive of this sense. Thus we find that the secretion from the above sources flows in the depressions (*meatus*) of

the outer wall, and not on the convexities of the scrolls,—an observation original, we believe, with Dr. J. G. Guiteras.*

In common with other parts, the *floor* of the nose is sloped a little downward, so that the tears entering the inferior meatus also tend backward. In extremes of excess only, as in violent weeping, do the tears flow forward on the face. The secretion from the maxillary sinus cannot escape while the erect position is maintained, unless the fluid is raised to the level of the nasal orifice. As a rule, we may say that the sinus of one side empties itself while the subject is lying prone on the opposite side.

The communication of the nose with the pharynx is called the posterior naris. But we should not forget that this term applies to the *skull* rather than the parts in the living subject,—for we find its equivalent, the anterior naris, confined to the aperture of the nostril. The anterior orifice of the nasal chamber is more comparable to the posterior naris. It is unfortunate that these terms are not more carefully distinguished. Many persons apply the term "*nostril*" to any or all parts of the nasal chamber. Others call the nostril the "*anterior nares*." It should be remembered that the nostril belongs to the external nose; is an orifice, not a chamber; that both nares are also orifices. A better term than posterior naris to express the parts as seen in the living subject would be *choana*, a term already in use by continental writers. The parts, as seen by reflected light within the choana, form the rhinal image. The lateral opening of the nasal chamber is the spheno-palatine foramen. This is occupied in life by the spheno-palatine vessels and nerves. In certain morbid conditions tumors within the spheno-maxillary space may enter the nasal chamber, or, on the other hand, arising within the nasal chamber, a tumor may pass outward through the foramen.† Polypus of the nasal chamber may extend into the orbit, as occurred in a case recorded by Skey.‡ In consequence of the relative large size of this foramen to the structures passing through it, neuralgia of the nasal chamber is an unknown affection.

The *mucous membrane* lining the nasal chamber is very thin, and comparatively free from glands, as seen in the vestibule and the inner wall; but is thicker, more vascular, and yields a larger number of glands, where it covers the scrolls. In the latter place it is furnished with plexiform arrangements of veins, which, according to Dr. Cohen,§ favor the sudden stoppage of the nose, occurring in catarrhal affections of

* An inaugural thesis for the degree of doctor of medicine in the University of Pennsylvania, entitled "The Development of the Skeleton as influenced by Functional Activity," 1878.

† Chir. Anat. Blandin, Doane's Trans., p. 68; Chir. Anat., Velpeau, i. 84.

‡ Lancet, 1860, i. 118.

§ Diseases of the Throat, etc. Dr. J. Solis Cohen, 248.

the nasal mucous membrane, and permit as prompt a subsidence, under the use of remedies which constrict the blood-vessels. The membrane where it overlies the turbinated bones is thicker than elsewhere, and subject to an œdematous condition which may be mistaken for polypus. A similar appearance may arise from chronic inflammation of the mucous membrane.

Inflammation.—The anatomical relations of the mucous membrane with the bones are, in the nasal chamber, something of the same kind witnessed between the gum-tissue and the adjacent bone. They are less pronounced, however, and in a healthy condition are scarcely evident. But in the engorgement accompanying an acute attack of inflammation, particularly in the type which is not relieved by simple flushing of the mucous follicles, but which promotes free exudation of serum from the blood-vessels, the underlying periosteal layer becomes involved, and in specific inflammation the bone itself speedily affected. Hence the early losses of the turbinated bones from necrosis in syphilis. Many phases of ozæna exhibit a necrotic tendency of the turbinates, to account for their persistency.

Localization of Diseased Action.—The nasal chamber is bounded by such natural parts, that we can best divide this portion of our subject by (a) the roof, (b) the floor, (c) the inner wall, and (d) the outer wall.

(a) The narrow cribriform plate forming the greater part of the roof of the chamber is, in cases of its insufficient development in the encephalous, converted into a few large holes.* At times, in subjects in other ways well formed, the cribriform plate is weak, and permits the brain to form a hernial protrusion into the nose, as defined by Velpeau† and Spring.‡ Prof. Retzius§ refers to a case of simple congenital meningocele at the root of the nose in a woman aged twenty-five. It is in confirmation of the sequestered position of the nasal chamber that so thin a plate of bone should be all that intervenes between the brain-case and the surrounding air. That so slight a barrier to serious encranial involvement exists should certainly always be remembered, not only in treating diseases, but in detecting crime. It is well known that a favorite means of committing infanticide is by thrusting a long bodkin or wire up the nose from in front. The ancient Egyptians removed the brains of the bodies of their dead through the laceration of the cribriform plate in their process of embalment. But, unfortunately, we cannot leave the record at this point. Sir Charles Bell mentions, in his *Surgery*, a case where the operator, in attempting to remove a nasal polypus, destroyed

* Otto, *Path. Anat.*, 176.

† *Chirurg. Anatomie*, i. 104.

‡ *Hernie du Cerveau*, Brussels, 1855.

§ *Med. Times and Gazette*, 1860, 180.

the cribriform plate and excited meningitis, which proved fatal on the sixth day. According to J. Cooper Forster,* disease of the bones within the nose can involve the base of the skull, and continue thence through the cribriform plate to the membranes of the brain. Fibrous polypus not unfrequently arises from the sphenoidal turbinates, as in a noted case recorded by Demarquay.†

(b) The *floor* of the nasal chamber may be said to present few or no peculiarities of diseased action which are not in common with those of the upper jaw. The most common lesion is specific necrosis; and occasionally a fibrous tumor appearing—within the mouth. These have been mentioned in the preceding chapter. In a case of fibrous polypus operated upon by Dr. Mott, two distinct tumors were discovered adhering by separate peduncles to the floor of the nasal chamber, one of them projecting forward, the other backward, into the pharynx, winding around the posterior edge of the septum.‡

(c) The *inner* or septal wall. The mucous membrane covering the septum is less adherent posteriorly than anteriorly, and is apt to form at that point œdematous swellings. These were first described by Dr. J. Solis Cohen (*loc. cit.*, p. 297), under the name of submucous infiltration. Fergusson§ mentions a case of nasal polypus which originated from the ethmoid bone, and extended thence to the occipital condyles, and was attached to both sides of the septum. Of the rare lesion, congenital deficiency of the vomer, we have observed the following: G. S., aged 24, came under our notice August, 1870, complaining of fluids and solids occasionally passing up into the nose during deglutition. He was subject to a laryngeal cough, the cause of which was not detected. His speech resembled that of a person having cleft palate,—a peculiar nasal sniff preceded each expiratory sound. He was slow in learning to talk, and does not pronounce letters C, S, and X clearly. Upon rhinoscopic examination the vomer was found deficient at its posterior part at its lower third. The left naris was contracted. The middle turbinated was imperfectly developed.

(d) The *outer* wall. This is the most fertile region for the development of nasal polypus, if, indeed, it is not its true seat. As is well known, gelatinous or typical polypus consists of crypt-like sacs, as was probably first announced by Watson (*loc. cit.*), which, by the weight of the mass, is pendent by a more or less narrowed pedicle. This pedicle is almost invariably attached to the nasal lamella of the ethmoid bone.

* Tr. Clin. Soc. London, iv. 162.

† Le Mouvement Médical, 1869, 19, 221.

‡ Watson. Am. Jour. Med. Sci., 1842, 325.

§ System of Practical Surgery, 483.

When multiple, the ethmoid cells, lachrymal and turbinated bones yield points of attachment as well. The fibrous polypus is not a product of the mucous membrane, but of the subjacent connective tissue. It has a wider range of origin, and may arise from other parts than the outer wall, as already mentioned. Many instances of so-called multiple fibrous polypus arising from the frontal sinus, lachrymal bone, and sphenoidal sinus are, no doubt, members of the group of round-celled sarcomes.

(To be continued.)

CYSTO-SARCOMA IN THE UPPER JAW.

BY J. FREDERICK BABCOCK, D.D.S., BANGOR, MAINE.

A GENTLEMAN of this city recently called upon me with his niece, Miss Katie J., a little girl twelve years of age, whose home was in Presque Isle, Aroostook County, desiring an examination of a swelling in her mouth. I found the whole surface covered by the canine and incisive fossæ, to the right of the median line, occupied by a tumor, which I at once diagnosed as cystic in its nature, while the entire cheek and lip showed its sympathy by the swelling apparent, and in the soreness as evinced by the touch. The distention of the bone and tissues inside the mouth was very marked, though the soft tissues covering the parts were in no manner otherwise involved, the appearance of the tumor being benign. The right lateral incisor and first bicuspid of same side were evidently much involved, as their roots passed directly into the tumor, both teeth being exceedingly loose, while the canine of this side was entirely absent. The remainder of the teeth common to the age were fully developed, and in their proper positions in the arch.

Upon inquiry, the following history of the case was revealed:

When six years of age—now twelve—while playing with companions, she received a sharp blow from a heavy stick; said blow did not displace any of the temporary teeth, but marked swelling of the cheek and lip upon this—the right—side ensued, and for a time she suffered much pain. In regular order the temporary set gave way to the permanent, all of which made their appearance, with the single exception of the right canine, which, it was claimed, had never erupted. No further notice had been taken of the affair connected with the blow until the arrival of her tenth year, when a slight swelling was observed just over the canine fossa, which swelling had increased, gradually during the following two years, but more noticeably during the last six months, to what I have above described upon presentation.

Such was the history of the case, and it would have warranted any surgeon in pronouncing the case (in the absence of any cachexia) to be one of cystic tumor, the odontocoele, or encystment of the unerupted

canine, being the exciting-cause; since the age at which the swelling was first noticed corresponded so exactly with the age when the eruption of these teeth is at its most active stage, as was sufficiently proved at this time by the appearance and full development in the arch of its mate, the left canine.

It was desired that I should undertake the treatment of the case; and, pending some correspondence with the child's parents upon the subject of an operation for its removal, I proceeded so to do. My first step was to pass an exploring-needle into the body of the tumor. With a slight effort it passed through the bone and thence into the cyst; upon its withdrawal it was followed by—first, a thin, watery fluid of brownish color, and then by light-colored pus of a creamy consistency. I endeavored to probe for the missing tooth, but was obliged to desist, in consequence of the pain inflicted. Made another incision near the first, and proceeded upon a tentative treatment, designing thereby to reduce the swelling and evacuate the collected pus; ropes of cotton were forced into the incisions made, and the case dismissed. Upon the next appearance the tents were withdrawn, and pus flowed in large quantities; could now use the probe with more facility, but it was still too painful for a free manipulation; replaced tents, and upon removing them at the next presentation very little pus followed, while the swelling and soreness had decreased in a marked degree. Could now use the probe exceedingly well, but could find no evidence whatever of the presumed odontocoele. The child's parents having, in the meantime, consented to the operation, the little patient was, with the valuable assistance of Dr. George Foster, placed under the influence of ether, when I made with my knife an incision, in the shape of a half-circle, entirely around the base of the tumor; dissected up the gum and other soft tissues, and thus the bone, composing the dome of the cyst, was fully exposed to view; this was cut away with my scissors, and the contents of the cyst were plainly visible; to the touch they felt, and to the eye they looked, very like brain-matter. They proved to be of a gelatinous and cartilaginous nature, and completely filled the entire cyst. I proceeded to remove these contents with the handle of my knife, which done, the walls of the cyst were exposed to view.

Placing the little finger in the cyst—which could be done with extreme facility—the mucous lining of its walls could be readily felt; but there were *no signs whatever to be distinguished of the odontocoele*, either with the finger or the probe.

Naturally much surprised at this state of affairs, I made every effort to discover its whereabouts, but failed utterly; and it was not until later that any facts upon which to build a theory by which to account for its absence were ascertained. It afterwards appeared in a conversation with her parents, whom I did not see previous to the operation,

that some time within eighteen months she had had a tooth extracted from that side; which one they were not certain, though they feel very sure it could not have been the right canine, since their country practitioner had been *watching* this tumor, with the expectation that the absent canine would shortly make its appearance, and thus prove the *cure of the tumor*,—a state of affairs which, in the absence of the odontocoele, may be taken *cum grano salis*. The only satisfactory theory is to consider the tooth then extracted to be the now-missing canine. Otherwise, what has become of it? I do not consider it a probable theory to account for its absence on the ground of absorption, since it would prove a most difficult matter to demonstrate it; and if the theory of its extraction be discarded, such an explanation would seem the only alternative.

Another thing which caused me much surprise was its very great size, and yet there was not the slightest communication between it and the sinus, or between it and the nares. Taking all these peculiar diagnostic signs into consideration, I am forced into the conclusion that this tumor was a cysto-sarcoma, and in this light the case is to me most interesting, since they are exceedingly rare, especially of such size, in the superior jaw, though comparatively common in the inferior. The two teeth whose roots were identified with the tumor were extracted, and were found to be much diseased, besides being absorbed nearly one-half. The cyst was bathed in iodine just after the operation, and stuffed entirely full of lint, while the following was prescribed with which to bathe the cheek and face,—

R.—Plumbi Acetatis, ℥ij;
Tincturæ Opii, f℥ij;
Aque, f℥xvi. M.

Sig.—Keep parts continuously wet.

The following was given as a wash for the mouth:

R.—Tinct. Arnicæ, f℥ij;
Potassæ Chloratis, ℥ij;
Aque Colognæ, f℥j;
Aque, f℥iv. M.

Sig.—Rinse parts frequently.

Morph. sulph. gr. $\frac{1}{2}$ was ordered to be given at night of operation, and magnesia sulph. $\frac{3}{4}$ to be taken next forenoon.

The tumor was exceedingly vascular in character, as proved by the large quantity of blood which flowed during the operation, though ligatures were not found necessary. Placing a section of the tumor's contents in the field of my microscope—one of Zentmeyer's army stands—and examining under powers varying from thirty-seven to five

hundred diameters, the only characteristics visible were the cartilage-cells. The following after-treatment and progress of Miss Katie's recovery are taken from the memoranda made at the time in my note-book.

First day after operation.—Called upon my patient at her residence, and found her as bright and cheerful as a bird. Very slight inflammation, indeed, but little soreness,—patient had passed an exceedingly comfortable night, sleeping soundly, without the aid of the opiate, which had been withheld on account of homœopathic tendencies. Removed the stuffing of lint from the cyst, and, with the hypodermic, injected iodine, followed by the saturation of lint in same tincture, and stuffing well into the cyst; object, to induce the formation of healthy granulations. The lead-water and laudanum continued.

Second day—Patient about as before; swelling slightly increased; removed the lint, and made an injection of phenol sodique, diluted one-third, followed by injections of iodine as before. Replaced lint in such a position as simply to keep entrance patulous, and easy of ingress. As there was a slight odor from decomposing blood-clot, ordered, instead of the arnica and potassa, phenol sodique, diluted eight times. Lead-water, etc., continued.

Third day.—Patient steadily improving; swelling and soreness decreasing; replaced lint, saturated in iodine; marked evidences of granulation.

Fourth day.—Everything progressing in the most satisfactory manner possible; granulations setting in finely; replaced lint dry; swelling nearly gone, soreness entirely; discontinued lead-water; mouth to be occasionally rinsed with phenol sodique, diluted.

Fifth day.—Granulations increasing rapidly; replaced lint, slightly moistened with iodine; swelling and soreness entirely gone.

Sixth, seventh, eighth, and ninth days.—Did not see patient.

Tenth day.—Found cyst entirely filled with granulations; made slight treatment with iodine; gave instructions to mother to keep the entrance to cyst patulous for a week, and dismissed the case.

The little patient at once proceeded to her home in Presque Isle, and I have not seen her since, though I was to-day informed, by letter, that the cyst was almost closed, and that she had been steadily improving. In reference to the chances of a reformation of this cysto-sarcoma, I would say that, in this particular instance, I have strong grounds for hoping that such will not prove the case, though ordinarily such a result would not, to say the least, be at all improbable. I have only to add that the little patient was, and had been at all times, the very picture of health itself.

PROCEEDINGS OF DENTAL SOCIETIES.

ASSOCIATION OF THE ALUMNI OF THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE fourth annual meeting of this Association convened at the college building, southeast corner Arch and Tenth Streets, on Friday morning, February 27th; the President, Dr. C. A. Marvin, of Brooklyn, N. Y., in the chair, Dr. Joseph Pettit, of Philadelphia, Secretary.

Dr. Marvin delivered the annual address.

Dr. C. E. Francis, of New York, chairman of committee, read a report on Operative Dentistry, which was accepted.

Essays were read by Dr. D. S. Dickerman, of Taunton, Mass., on "The Elevation of the Dental Profession;" by Dr. W. C. Wardlaw, of Augusta, Ga., on "Periostitis;" by Dr. J. Edward Line, of Rochester, N. Y., "About Pepsin;" by Dr. Thomas T. Moore, of Columbia, S. C., on "Necrosis of the Lower Jaw;" by Dr. John S. Smith, of Columbia, Pa., on "Union of the Dens Sapiientia with the Second Molar."*

Prof. Barker delivered a lengthy oral address upon "The Old and New Methods of Correcting Irregularities," stating that the old methods were intricate, the appliances worn with great discomfort, and that attempts to regulate were something that every operator avoided if possible, because attended with a great amount of labor, the compensation being slight. He deprecated the use of plates and the inclined plane, claiming that by such practice the proper articulation was likely to be destroyed. In all cases, before commencing the operation, it is necessary to have the patients not only willing, but anxious that it be done, for then they do not object to the discomfort necessarily attendant. Whenever a tooth is moved there must be absorption and corresponding deposition of new tissue, and this is best brought about by having the will of the patient enlisted, such state being conducive to nutrition. He regulates by elastic ligatures entirely, and expects success in three or four weeks. Most operators have difficulty in preventing ligatures from slipping up at the neck of the tooth and causing irritation. This difficulty he obviates by passing a gilling-twine ligature posteriorly above the basilar portion of the tooth, bringing it anteriorly to about the middle of the labial surface; here it is tied in a surgeon's knot (by passing the ends of the string through twice); it is then carried posteriorly to a point midway between the basilar ridge

* We hope to be able to present these papers, or abstracts of them, in a succeeding number of the DENTAL COSMOS.

and cutting edge, the ligature being brought over the anterior face, when it is tied with the knot first made. This is, to all intents and purposes, two ligatures joined at about the center of the labial surface, and, as each holds the other in position, there is no possibility of either of them slipping. If it is desired to rotate a tooth, the knot may be placed on one side or the other as may be necessary to apply the force in the proper direction to produce the desired result. The elastic band is attached to this double knot and passed anteriorly to those teeth that are outside, and posteriorly to those that are inside the arch. He attaches the band to two or three other teeth, that their resistance may be greater than the force required to move those teeth which it is desired to regulate. A number of models of cases that were successfully treated by him in this way were shown, and the *modus operandi* explained at length.

Prof. Truman. On one or two points I cannot agree with Dr. Barker. It must be evident to all who have had any experience in ligatures at the necks of the teeth, that their tendency is to produce irritation of the periosteum. This may assume serious proportions and result in necrosis of the tooth. By the use of properly adjusted plate appliances, this may be wholly avoided. I doubt whether any time is gained by this process. A certain amount of force is required to move a tooth, and that force must produce absorption of the alveolus before the tooth can materially change its position. With absorption, there must be subsequent redeposition of osseous material, or, in other words, a new socket formed. This requires the same amount of time, whether the movement be made rapidly or otherwise. The disfigurement to the mouth by ligature is a serious matter. Our chief aim in regulating appliances should be to render them as comfortable and as far removed from general observation as possible. Ligatures and bands on the labial surface should, for this reason, be avoided.

Prof. Barker. With regard to objections, I like to hear them. This plan is not a new thing with me, but the result of years of experience, and I have yet to see one case where I regretted using ligatures in the correction of irregularities. I believe it is just as safe as any other plan. I am careful that the ligature at the neck of the tooth has no tendency to slip up,—the other, near the cutting edge, prevents its doing so—one tie overcomes the action of the other. On bicuspsids, I first tie the ligature around the tooth at the neck, and then pass it between the cusps to prevent its slipping up. When there is a small inferior and large superior maxilla, I may extract. Each case requires special action. Rubber between the teeth must expand the arch.

Dr. Bogue. Do we invariably expand the arch by putting in rubber wedges?

Prof. Barker. Yes, sir.

Dr. Bogue differed with Dr. Barker, stating that by this mode of procedure we may cause irregularity ; that wedges and ligatures may be entirely ineffectual in some cases, and instancing cases in practice in support of his views.

Dr. Guilford. When the teeth are lapped, 'rubber wedges must rotate them.

Prof. Barker brought before the association a patient who had a strong hereditary tendency to a large projecting superior maxilla, and said: This tendency I overcame by extracting two perfectly sound six-year molars. There would not be such a thing as irregularity if the dentist could get the child young enough. We must realize the fact that the jaws of civilized nations are generally too small for thirty-two teeth. I have no objection to the extraction of the six-year molars, if done at the proper time, but I do not wish to be understood as advocating injudicious extraction.

Prof. Truman. Was the protrusion mentioned an existing fact, or was it only anticipated ?

Prof. Barker. The tendency was anticipated ; the six-year molars were extracted before the eruption of the second molars.

Prof. Truman. As there was no irregularity to treat in this case, I cannot discover any justifiable reason for the removal of the first permanent molars. In this patient the articulation of the anterior teeth is perfect, while the proper articulation of the bicuspid has been destroyed by the extraction. The masticating surfaces of these teeth strike directly upon each other, producing, in my judgment, a serious irregularity. In the normal articulation, no tooth strikes directly on its antagonist, but has a direct bearing upon two teeth,—this is absolutely essential for perfect mastication, and to prevent elongation by the loss of one of the antagonizing teeth. It is very evident that in this child there has been another deformity produced, though not, in her case, a serious one—I allude to the separation of the teeth. The bicuspid have fallen back, leaving a wide space. This may be considered an advantage, as it insures the teeth from decay on the proximal surfaces. In so far, it will prove a benefit ; but the danger is imminent of having all the anterior teeth following the lead of the bicuspid. The tendency of all teeth is to fall back from the median line. Give space sufficient posteriorly, and this will certainly be accomplished. If a space is made eventually between the central incisors, an irregularity is produced that is by far the most difficult to correct. The difficulty is not in bringing these teeth together, but in keeping them in position. This is one of the serious objections to the extraction of the six-year-old molars, and were that subject up for consideration, I might give other reasons against the wholesale destruction of these teeth, which, if not the best, have many points of superiority over all the other molars.

The following remarks were elicited by the reading of the paper on "Periostitis," by Dr. Wardlaw :

Prof. Barker. Periostitis may be propagated from some distant point, or may be transmitted from a living pulp to the periosteum. The treatment may not have been curative from the violence of the inflammation, or from an improper use of remedies.

Dr. J. S. Smith, Columbia, Pa. Periostitis may arise from tartar in the interstices of the teeth, and may be transmitted to the dental pulp and cause pulpitis.

Prof. Buckingham. In practice we constantly meet with these cases. The pulp that is affected may be restored to health, as may other diseased tissue, if the inflammation does not go too far. I see no reason why the pulp should not continue alive.

Dr. Searle. It seems, in this case, that the trouble followed taking cold. There may be periostitis without any local cause. Four months since a gentleman was attacked with severe pain in a lower molar. I made an examination, but could find no local cause to indicate disorder. The last call the patient made, he complained of not feeling well. I advised him to treat himself as if he had taken cold. In three weeks he died of typhoid fever. I think his teeth were perfectly healthy, and the trouble in the tooth was caused by the condition of the system.

Prof. Truman. Periostitis may exist with a living pulp, but it may not be destructive in its character. It may be produced by a continuous force applied to the tooth, as in regulating,—where a filling has been left too full, or from irritation at the neck. Periostitis may also exist with the pulp in a highly congested condition without loss of vitality.

What do we understand by inflammation of a part? With the more recent investigations on this subject before us we may dispense with the old and unmeaning terms, and define it as an irritation, however produced, that will result in the aggregation of the white blood-corpuscles at that part, and their subsequent transmission through the coats of the vessel. The result is so-called pus. There are other conditions consequent upon this operation, such as heat, swelling, etc., but this, in as few words as possible, is the process. It is very clear that the first operation is to remove the irritating cause; the second, to relieve the congested condition of the vessels locally distended. If we can accomplish this, we successfully treat periostitis; if we fail, it must progress to abscess. To treat periostitis, we freely produce counter-irritation in another but adjacent part; deplete the capillaries in the surface of the gum, and make use of certain remedies to produce absorption. A greater percentage of success will be realized if we bring to bear refrigerating influences directly to the part irritated. By these we contract the vessels at once, resulting in a cessation of abnormal action and a return to normal condition. To accomplish this, I have

found the most efficient agent to be rhigolene spray applied at intervals *to the tooth* and not to the gum. The first effect is increased pain; this soon subsides, followed by great relief. The application must be repeated. In fact, any treatment must be persistent to be efficient. The patient should not be allowed to leave the office until relief is secured. If this fails, there is but one course of treatment to effect good results, and that is to penetrate to the apex of the root affected. This may be done either through the pulp-canal or through the gum and alveolus. The latter, if performed properly, is, in my judgment, the best, because the least painful. For this purpose use a small chisel-drill, well sharpened; pass this through the gum over the apex, and, with a few turns, it drops into the cavity of the socket. The relief is positive, but may not be completely manifested for two or three hours. This treatment is applicable to all the ten anterior teeth, and there should be no hesitation in resorting to it at once.

The reading of the paper "About Pepsin," by Dr. Line, elicited the following remarks:

Prof. Buckingham. Pepsin is comparatively a new remedy in dental practice, and I presume few have tried it. It is prepared from the stomach of animals, and is supposed to contain the active principle of the gastric juice. I believe it is mostly prepared from the stomach of the hog, as that animal, in its habits and tastes, most resembles the human species. It is administered to assist digestion in weak and debilitated stomachs, and its active properties are estimated by the quantity of albumen or fibrin a given amount of it will dissolve. "If properly prepared, fifteen grains, with the aid of a little lactic or muriatic acid, will cause the solution, in water, of four times its weight of fibrin, at the temperature of the human body." Pepsin has been used internally as a medicine for a number of years, but I do not know of its having been used as an external remedy until recently. "The gastric juice of animals was applied more than forty years ago by Dr. P. S. Physick, of Philadelphia, with considerable success, as a local application to cancers and sloughing ulcers, with a view of removing the dead bone and flesh, correcting the offensive odors, and yielding a hearty stimulus to the diseased surface."

I suppose when pepsin is applied to an exposed and suppurating pulp it acts as the gastric juice does upon ulcers, by dissolving the putrid matter, destroying its irritating properties, and thereby allowing the more healthy portion to assume its normal condition.

Dr. Huey. I indorse the idea of capping pulps with a solution of chloroform and Canada balsam. Since adopting this treatment, I have never had a case where pain continued for any length of time. I advise others to try it, and they will be successful.

Dr. Searle. We have always, it seems to me, pursued heroic treat-

ment with exposed pulps; we should apply mild dressings, as we would apply mild dressings to injuries elsewhere. Instead of using carbolic acid in full strength, I use the aqueous solution, containing only five per cent. of carbolic acid. When I first commenced using it, I did not suppose that it would promptly relieve pain; but I find that cotton cloth saturated with it, and laid upon the pulp, relieves it as soon as the pain caused by thermal change ceases. My success in this treatment warrants my continuing it. Any wounded tissue is not in condition to perform its normal function until it is restored to health. So the dental pulp must be restored to health, and then a new deposition of dentine may take place.

Prof. Barker. Certain tissues in certain places heal differently from other tissues in other places; for instance, we may have a pulp in a state of suppuration; there is effusion and breaking down of plastic matter and tissue: this constitutes suppuration. Now we apply an escharotic, and have albumen converted into an insoluble substance and coating. The pulp, when previously suppurating, never heals except under the most favorable circumstances, and then it is by the effusion of plastic matter, and the formation of cicatricial tissue. It may be possible to preserve pulps when in this pathological condition, but in my experience success is the exception,—I mean when the pulp has suppurated or has been long exposed.

Prof. Truman. The pulp is simply the remains of the original papilla that formed the tooth. That we do have deposition is shown in the deposit of osteo-dentine, or nodules, or in deposit when there is wearing down of the teeth. I hold that pulps can be saved even after there has been suppuration. Pus is, as I before remarked, merely a collection of white blood-corpuscles that have escaped through the coats of the blood-vessel.

Prof. Buckingham. In the pulp we have tissue confined within bony walls, and subject to the same diseases as other tissue. Tissue is always more likely to suppurate when exposed to the air, on account of vegetable or animal spores that get into it and continue to multiply until inflammation is set up. I advise the application of escharotics, and know of nothing better than creasote or chloride of zinc in some form. This will coagulate the albumen and protect it from the air.

The amendment to section 1st, article 5th, of the Constitution, offered last year, viz., to strike out the words "Provided such meeting shall be held on the same day upon which the commencement of the Pennsylvania College of Dental Surgery occurs," was, upon motion, adopted.

A protest relative to a proposed work to be published by the Atlantic Publishing Company, said book to contain a history of American dentistry and biographical sketches of American dentists, sent to the asso-

ciation by Dr. Louis Jack for their action, was read, and the following resolution relating thereto unanimously passed :

Resolved, That it is the opinion of this association, emphatically expressed, that the proposed volume in the interest of which one Mr. Townsend is canvassing the profession, and which is intended to contain a history of American dentistry, and also biographies of individual dentists, with accompanying portraits, is not calculated to elevate the dignity or high character of the profession, and should receive the disapproval of all those who love the honor of their profession, and are unwilling to see it injured for the purposes of speculation.

After the transaction of routine business, an election was held for officers to serve the ensuing year, with the following result :

President.—Dr. C. S. Stockton.

Vice-President.—Dr. E. T. Darby.

Recording Secretary.—Dr. Joseph Pettit.

Corresponding Secretary.—Dr. E. H. Neall.

Treasurer.—Dr. W. R. Millard.

Executive Committee.—Drs. T. L. Buckingham, H. C. Register, James Truman, G. T. Barker, E. R. Pettit.

Adjourned.

JOSEPH PETTIT, *Secretary*.

ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

A MEETING of the society was held at the Philadelphia Dental College, No. 108 North Tenth Street, on Wednesday evening, January, 7th, 1874.

Drs. Millard, Spencer Roberts, and Brooke Davis were elected active members.

Dr. J. H. McQuillen proposed as an honorary member Dr. Joseph G. Richardson, and moved that the usual formalities be dispensed with, so as to permit immediate action. The motion was carried, and he was duly elected.

A specimen was presented through Dr. T. C. Stellwagen, from Dr. S. E. Balis, of Albany, of a lower molar tooth.

A communication from Dr. Louis Jack, Treasurer of the Board of Trustees of the Donation Fund, was read.

The essayist of the evening, Dr. C. E. Francis, of New York, who appeared in response to an invitation from the society, was then introduced, and after a few introductory remarks, read an essay on "Conservatism in Dental Practice."*

At the conclusion of the paper, the members, being called on individually, expressed themselves highly pleased with it, and thoroughly approved the practice advocated therein.

* See DENTAL COSMOS for April, 1874, page 180.

Dr. Samuel Welchens, of Lancaster, Pa., having been called upon to speak on the subject of the essay, did so with considerable hesitation; feeling as a new member of the Odontographic Society, and especially regarding its high scientific reputation, that he would prefer hearing and learning to speaking.

He thinks, however, from the prevailing sentiment of approval, Dr. Francis has great cause for congratulation that he has met so exactly the approbation of the members present, in the conservative position he has taken in the interesting and instructive essay just read; has always regarded the six-year molars as among the most important dental organs in the mouth. They are the corner-stones of the arches, the outposts and main supports of the whole process of second dentition.

In the course of twenty-five years' practice he has seen far more injury from a premature and injudicious removal of them than by their careful treatment and retention. In the regulation of crowded or irregular dentures would prefer extracting a biscuspid, or any other of the back teeth that might be in the way, to the six-year molar, unless it should be so much decayed as to render such practice injudicious. A conservative course of treatment in every instance should be the rule, and extremes the exception. So also in regard to contour-fillings: they are as they leave the hands of our most skillful operators splendid specimens of artistic skill; but they should not be resorted to indiscriminately; where there is frail texture, histological changes of the membrane, or pathological condition of the roots of the teeth to be operated upon, a careful practitioner should hesitate long before risking his reputation in restoring broken-down tissue with gold, at a heavy expense to his patient.

The rubber dam is one of our most valuable appliances, and no one who has become expert in its use can ever think of doing without it; but it is often impracticable to torture a patient with its use. In all our operations, and in the use of all the new and valuable appliances crowding into the profession so profusely, there should be the greatest care taken not only to secure ease and comfort to the operator, but to avoid unnecessary pain and inconvenience to the patient. This can only be done by pursuing a conservative, manly course in practice. I therefore concur in the position so well taken and so ably set forth by the essayist.

Dr. Kingsbury remarked that if the record of his dental practice for the past twenty years could be critically examined, he thought it would be found to be in keeping with the views advocated by the essayist of the evening. He was glad to find that the profession were being more fully convinced of the importance and advantages of a conservative course of treatment. During the last few years he had observed with feelings of deep regret a strong tendency in the profession to run into

extremes in practice, and it could not be denied that this tendency had become quite general. Some persons are so constituted as to have a natural propensity to be ever riding some hobby or other; and, unfortunately, this peculiar idiosyncrasy has been strongly manifested in our profession. Old and well-established modes of practice have been forsaken for a time, and new-fangled ideas and methods have ruled the hour, and assumed a prominence that has led to repeated failures and disappointments. Indeed, a sort of monomania has so affected some as to lead them to attach so much importance to one thing, so to emphasize one idea, as to apparently lose sight of everything else. To such an extent is this true, that some of the most valuable discoveries in dental science, and things of acknowledged merit in the dental practice, have been subjected to most shameful abuses. Some went mad over crystal gold. In their opinion no other form of gold was fit to be used in filling teeth. Others lost their senses over cohesive gold; the old-fashioned, non-cohesive gold foil that had been used by the distinguished pioneers in our art, and that for so many years had demonstrated its value in the skillfully-filled and perfectly-preserved teeth of former generations, was denounced as worthless and utterly ignored. The mallet, an auxiliary of former years revived in later times, asserted its supremacy, and laid such heavy, stunning blows on some heads as to cause a new and strange disease that may be termed mallet-mania, with all its dangerous symptoms. Even yet some have not recovered from the singular hallucinations produced by the first shock. The uplifted mallet is ever before their eyes, and they are constantly crying, "The mallet! the mallet!" and nothing can be done without the mallet. They press it into service in all cases and on all occasions. Strong, steady, and skillful hand-pressure is of no avail in their opinion, and a tooth that cannot be filled with the mallet is not worth filling at all.

The rubber dam, too, has its fanatical devotees and its unfortunate victims. Some of the enthusiastic votaries of progress in this direction have been so intent upon arresting the copious flow of the salivary fountains with the elastic and impervious rubber, that they have raised the troublesome waters so high as to incur the danger of being submerged in the deep, viscid pool, and thus falling martyrs to their favorite idea, or offering themselves as sacrifices to their idol-god—the rubber dam.

Since anæsthetics came into use, and the extraction of teeth has thereby been made a painless operation, some in our ranks appear to have gone in for a general slaughter, and seem to sanction the wholesale extraction of the natural organs, and advocate the substitution of porcelain teeth on hard rubber; especially as the thing can be done so painlessly with gas, and so cheaply on rubber. Strange and in-

credible as it may sound, he frequently hears of dentists who strongly advise their patients to have all their teeth extracted as they decay, and to have artificial dentures, rather than go to the expense and trouble of having the natural teeth filled and preserved. In view of such cases we are ready to exclaim, Can it be possible that we have among us dental practitioners whose highest professional aspirations seem to be limited to the extraction of teeth without discrimination, and the insertion of dentures on hard rubber in such a manner as to show that they neither regard the claims of humanity, nor the first principles of dental prosthesis? Is it not time that such practice received its just rebuke? Gentlemen, too little attention has been paid to conservative dentistry. This is the practice demanded at our hands. It must be more or less eclectic. Our motto should be, "Prove all things; hold fast that which is good." He would not have any one infer from what he has said concerning the mallet and rubber dam, or crystal and cohesive gold, that he would in any degree undervalue them for meeting certain conditions and requirements; he regards them as almost indispensable, but he would have them used under proper discrimination. Even hard rubber as a base for teeth has its advantage in some circumstances. But the extent to which its use has obtained, to the exclusion of other more valuable materials, such as gold and platina, is greatly to be deprecated.

The preservation of the natural teeth in the mouths of our patients should be considered a prime article in our professional creed, an object of no secondary importance; and to this end should our thoughts, our studies, our investigations, our practice, and our earnest efforts be constantly directed. If there was any one feature in his own practice during the past twenty years that, upon reflection, afforded him more satisfaction than any other, it was the great interest he had felt in the treatment of that class of teeth seriously affected and badly impaired by deep-seated and extensive caries, and the consciousness of having directed his honest and unremitting efforts to their preservation. He felt gratified in being able to state that the result had been most encouraging, to say the least, if not at all times as satisfactory as anticipated. Many a tooth upon which sentence of condemnation had been passed had, upon careful examination, been found to be amenable to treatment, and had rewarded his efforts by many years of usefulness to his patient, and promised good service for years to come. He regretted to state that it was pretty generally understood and conceded that this class of operations is usually the least remunerative to the dentist, on account of the time and care required in performing them, to say nothing of the value of the material in those cases where gold is used. This, probably, is one reason why so many of this class of teeth are consigned to the remorseless forceps. On the same principle, might not

a physician neglect and abandon his very sick patients? and would not many good deeds be left unperformed in the various departments of life? Admitting that we are not, in the majority of such cases, fully and justly remunerated for our services, or in the same proportion as for the less difficult and ordinary operations, we ought not to forget and ignore certain moral obligations involved, of more weight than mere money-considerations, and by which we should feel bound to do for our patients the very best that the nature of the circumstances will permit. In order to give a more definite idea as to some of the operations in his own daily practice, in which he seeks the conservation of the dental family, he would cite a case or two in point. This very morning he had in his chair a patient for whom he performed some difficult and complicated operations seven years ago. This gentleman had previously been a patient of that distinguished and skillful operator, the late lamented Dr. Amos Westcott; consequently he knew the value of the natural teeth and felt the importance of saving them. There were two teeth in his mouth in regard to which he evinced great anxiety,—the two inferior six-year molars; they were both badly decayed,—the right one having a dead pulp, and the left one badly broken away, but with the pulp intact. He treated the pulp-cavities of the tooth on the right side by carefully removing every putrescent fragment, and temporarily filling the canals with cotton, previously saturated with creasote and then squeezed dry in the folds of a napkin; after the lapse of a few days, filled the canals with gold. The grinding, the buccal, and a part of the distal surfaces of this tooth were gone; but the portions remaining being strong, he felt justified in filling the crown, so as to restore it nearly to its normal form, making what would ordinarily be regarded as a contour-filling.

The other tooth was treated in quite a different manner. The buccal and both of the proximal walls of this tooth were broken away, leaving only a strong lingual wall; he drilled large retaining-points, avoiding interference with the pulp, which, fortunately, had receded by the formation of secondary dentine, and proceeded to fill the tooth with gold. But instead of making a contour-filling, and restoring the crown of the tooth to its former size, he gave a rounder surface from the grinding edge of the lingual wall down to the neck of the tooth on the buccal surface. By adopting this form, the grinding surface was diminished at least one-third; but this loss was of no importance compared to the advantages secured in such a case. This operation has been-tested for the past seven years, and shows no deterioration.

Dr. Kingsbury always tries to save the six-year molars, and endeavors to impress upon the minds of the parents of children the importance of sending them early to the dentist; for his part, he likes to see them at the seventh year of their life; and even at this early age, so prone

are the teeth of the children of the period to decay, that he often finds it necessary to insert one, and sometimes two, gold fillings in each of the six-year molars.

Dr. J. H. McQuillen said : There is such a sense of relief to both patients and operator in the use of the rubber dam, that he applies it in the majority of cases. The profession and community are under great obligations to Dr. Barnum for his simple and valuable improvement ; it is not only to protect the tooth from the saliva that the dam is useful, but also from the breath, laden as it is with moisture, mucus, and epithelial cells from the lung, which, coming in contact with the gold, interferes to a marked extent with the cohesive properties of the metal. He fully concurs with the essayist in relation to the six-year molars ; formerly he was an extremist in this direction, and opposed not only their removal, but believed that they should be filled under all circumstances with gold ; experience has, however, modified his views on this subject ; he is now governed entirely by circumstances. The great obstacle in treating these teeth is, that the parents put off having their children's teeth examined till caries has made such progress as to make their preservation extremely difficult. In the majority of cases there is the most deplorable ignorance on the part of parents in relation to the character of these teeth, and it is sometimes an exceedingly difficult matter to convince a mother that they do not belong to the deciduous set. This is the reason why they are generally so badly decayed when the patient is brought to the office.

In the treatment of these molars when the jaws are large, and the dental arch expanded and the teeth regular, he makes every effort to preserve them for a long period of usefulness. On the other hand, when the jaws are small, the arch contracted, and the teeth irregular, his efforts are directed towards preserving them for a limited period, —i.e. up to the time when the second molars are about to erupt.

Dr. Louis Jack said : In some connection with the remark of Dr. McQuillen, as well as of Dr. Kingsbury, in reference to the extraction of the first molars, arises a question which, it seems to me, can be usefully discussed : namely, when the condition of the mouth and these teeth indicate a necessity for their removal, what may be considered the correct period at which to extract them ?

Dr. Thomas C. Stellwagen. The sixth-year molars should rarely be extracted before the presenting of the twelfth-year molars under the gum, or after the patient arrives at maturity. In fact, after the complete eruption of the second molars, it is too late to obtain the best results, and the first should be allowed to remain, in most instances, until the approach of the wisdom-teeth again gives an opportunity more favorable for their removal. It is presumed that we are speaking of cases where, although diseased, there yet remains a possibility of saving

the first molars, by careful operations, capping or destroying the pulps, etc., until the patient's twenty-fifth or thirtieth year, and that their retention up to this time in the mouth is not detrimental to the general health or surrounding tissues. When the pulps of these teeth are exposed before the patient's eleventh year, he endeavors to save them by capping the living, or extirpating the dead pulps, according to the peculiarities of the case, until the second molars present or the bicuspidis have erupted. When, however, these teeth are retained later, after the pulps have been so nearly exposed in early life, he finds that, in Philadelphia, it too often becomes necessary to devitalize the pulps and remove them before the teeth have completely hardened; so it is not uncommon to see the crowns break off as early as the thirtieth year, leaving the diseased roots to annoy, rather than comfort the patient.

The early period of life at which the sixth-year molars are erupted, and their consequently soft condition, together with the fact that they are often subjected to the deleterious action of vitiated saliva, the mouth containing the decaying and breaking-down tissues of the temporary molars; the lack of cleanliness from the tenderness of these teeth preventing not only the use of artificial means, but that more natural, of mastication, which latter acts unfavorably upon the stomach and results in acid eructations; the general neglect of parents, who erroneously suppose the first molars are to be shed and replaced as deciduous teeth are, and, therefore, are not surprised to find them decayed;—all tend to make them the most unfortunate, neglected, and short-lived of the permanent teeth.

After the twelfth-year molar has fully erupted, if he finds the pulp of the sixth-year molar exposed, or nearly so, he frequently tries capping, using a piece of gold-beater's skin directly over the pulp and oxychloride of zinc upon that, as first recommended by Dr. Louis Jack; when, however, the pulp is not exposed, but the thorough preparation of the cavity is prevented by its near approach, he uses some of the plastic fillings, frequently selecting amalgam, with the understanding that this should ultimately be removed and replaced with gold after from two to ten years, should the general health and condition of the teeth warrant it.

The following case will illustrate his convictions of the importance of retaining even parts of teeth in the mouths of adults: Mrs. —, æt. 49, applied for the purpose of having a lower second molar extracted. The distal half of the crown was broken down close to the gum; a fracture extended under it across the tooth, corresponding to the bifurcation at the root; found that this had separated the roots; after filling the anterior one and portion of crown remaining, the other was extracted. To-day that single root and its portion of the crown are doing good service and giving no pain to the patient. It has been

over three years since the operation was performed. The lady now masticates with comfort upon that side of the mouth, although prior to that operation she did not. His personal experience had long ago convinced him that twenty-eight good and sound teeth, fit for the purposes designed by nature, are better than twenty-eight hundred in the opposite condition; consequently, where the extraction of all badly-diseased first molars will afford a reasonable hope of preserving the remaining teeth from proximate surface decay, in contradistinction to the reverse, or crowded condition, with a full complement of molars and bicuspid, but with their proximate surfaces badly diseased, he prefers the former. Who but a mere tooth-filler would prefer thirty-two shells and wrecks, half tooth and half gold, with about the same number of contour-fillings, to twenty-eight perfect or nearly intact and comparatively healthy teeth?

Dr. Louis Jack. To approximate a solution of this question, it may be well to consider the consequences of the two extremes of treatment: a too early removal of these teeth, and of their extraction at too late a period; we may thus be enabled to find the middle ground which should indicate and decide the treatment.

FIG. 1.



The frequent result following the removal of the inferior first molar between the years of eight and ten, is represented by Fig. 1, which I have had drawn on the board. It will be observed that in consequence of the rapid cicatrization of the tissues and absorption of the alveolar process at the point operated upon, the anterior portion of the body of the maxilla in the plastic condition incident to early youth, is curved upward; as this takes place, the impingement of the inferior incisors against the lingual surfaces of the superior ones advances gradually upwards upon them, until at length the points may reach the tuberosity of these teeth, when the projection of their cutting edges becomes excessive. This deforms the face and deprives the upper incisors of their function. The change at the point of extraction is great, for the reason that the second molars are not there in a state of sufficient ad-

vancement to take the place of the first ones. In some instances this difficulty is caused by the premature removal of the deciduous molars. In case the first superior molar is removed at this early age at the same time the lower ones are extracted, the result is more disastrous than if the mischief is confined to the lower ones, for in addition to the effect produced upon the lower maxilla, the superior alveolar line is retreated, which increases the deformity to its maximum.

The protrusion then seen is the result of two actions: the passage of the ends of the inferior incisors towards the tuberosity of the upper ones, and the contraction of the upper maxilla.

The qualifying conditions to be considered are: if the temperament is nervous or sanguineous, the changes following the operation are rapid and decided; if lymphatic, they are slower and less decided.

FIG. 2.



The consequences following the loss of the inferior first molars at from thirteen years to eighteen are depicted in Fig. 2, which I have placed on the board. You will all recognize a too frequently seen result of what must be designated as pernicious treatment. The second molar has fallen forward to such a degree that the points only of the distal cusps are impinged upon, and an ugly-shaped gap is produced between this tooth and the bicuspid. This badly impairs the articulation of all the teeth. This, you will notice, is not an exaggerated representation, and too much cannot be said against a course of practice which will produce such results.

When the superior first molars alone are removed at an early age, the upper arch is liable to be contracted, the incisors frequently falling within the line of the inferior ones; and when this cannot take place, the posterior breadth is diminished; sometimes both results are met with in the same mouth. Their removal at the later period named, or afterwards, is not followed by any ill effects.

I have been led by the results of my observations to carefully avoid these extremes, and to seek for the correct period to perform the extraction of these teeth. The difficulties in forming an opinion of any given

case are confined to the inferior ones. The guiding indications I consider most reliable are the appearance or near approach of the first bicuspid in conjunction with the near presentation beneath the gum of the second molar, which usually occurs in orderly development when the child is about eleven years of age. It is important to have a close watch of the case, for when the second molar has risen to the height of the first, it is usually too late. After the twelfth year is completed I do my best to preserve them, however inferior they may be, keeping them in the best condition of which they are capable until the wisdom-teeth have found their position, and even then prefer a gradual loss by the incidents of frailty.

I would sum up my conclusions by stating that I would not in any case remove the superior first molars previous to, or at the same time the inferior ones are extracted, and prefer a year to intervene. I should not take away the inferior ones previous to ten and a half, nor do so after the second molar had fully erupted, and decidedly believe there is a period of less than two years in which it is correct practice to extract.

This is an important subject, since there are frequent cases wherein to benefit twenty-eight good teeth we are compelled to sacrifice four indifferent ones.

Dr. C. A. Kingsbury said a lady called upon him about four years ago, declaring she had broken a tooth whilst eating fried oysters; on close examination discovered the first left superior bicuspid was cleft from the crown to the bifurcation of the roots. He removed the palatine root with fragment of crown attached thereto, treating the remaining root and filling with gold; the buccal cusp being perfect, the tooth was to all appearances as good as ever, and is to this day doing good service. He wished to protest against the wholesale extraction of roots; he thinks that in many cases they can be filled and retained in the mouth without detriment to the remaining teeth; their presence prevents that absorption of the bony parts that is of such importance in maintaining the proper fullness of the face, a condition that cannot be prevented or restored by the insertion of artificial dentures.

Dr. C. E. Francis said the persistency displayed by Dr. Stellwagen, in his efforts to preserve the tooth referred to, reminded him of a case in his own practice. Some twenty years ago a lady (still one of his patients) had a very large cavity in her left inferior first molar filled with amalgam; since then, piece by piece, the crown broke away, until all was gone. It was then filed smooth, nearly even with the gum; the roots were still filled and not separated. She desired him to attach some sort of crown to make the tooth more serviceable. He introduced four large-sized screws, two in each root; then with a strip of platina he made a band as near the shape of a crown as possible, fitting the lower edge to the root, packed Bevins's stopping securely against inner

side of same edge, then filled in band to top with amalgam. It has proved a complete success.

As regards the capping of pulps. He has heard of using white court-plaster, but never before of gold-beater's skin. A small bit of note-paper, dipped in a solution of balsam of fir in chloroform, makes an excellent cap, and adheres snugly to the cavity. Since adopting this he has little or no trouble in capping healthy pulps.

Several years ago a young lady patient fell on the ice and broke a superior central incisor; called on him next day; tooth sore from blow, and pulp quite exposed; touched pulp with carbolic acid, and protected it with a small paper cap, and covered with oxychloride of zinc; having no anchorage, the paste came off within a fortnight, and was renewed; the same thing has recurred a number of times since; dentine always extremely sensitive, yet each time he has been able to drill a little deeper for retaining-pits. Pulp still alive, and beautifully covered with a deposit of secondary dentine.

Dr. S. H. Guilford remarked that he always made it a point to practice conservative dentistry, especially in regard to contour and non-contour work. Thought contour work very beautiful, and loved to do it when he thought the case warranted it. If the patient was able and willing to pay for it, and the tooth stood alone, or there was a fair space between it and its neighbor, he put in contour-filling; but if the patient could not pay for it, or if the tooth stood close to its fellow, he cut away the tooth or teeth on the Arthur plan and introduced flat filling. So far as the salvation of the teeth was concerned, there could be no doubt that flat fillings would accomplish the object as well as contour. Did not usually cut away sound teeth, unless he saw in them a decided tendency to decay on their proximal surfaces.

Used rubber dam because it was so valuable to him that he could not do without it. Also uses Jack's matrices, gold screws, burring engine, and electric plugger, because they enabled him to do better work.

In regard to the extraction of the sixth-year molars, he believed it best that they should be extracted in most cases; not only to prevent crowding the other teeth, and thereby inducing decay in them, but also to prevent crowding the teeth out of their natural position, thus producing irregularities.

Was glad to hear Dr. Jack say that they should be extracted, if at all, at about the eleventh year, because it confirmed what experience had taught him, namely, that when done, it should be done between the tenth and twelfth year.

On motion of Dr. Louis Jack, a vote of thanks was extended to the essayist, Dr. C. E. Francis, of New York.

Adjourned.

E. L. HEWITT, *Recording Secretary.*

JOINT SESSION OF THE MISSISSIPPI VALLEY AND MISSOURI STATE DENTAL SOCIETIES.

THESE two societies met in joint session in the city of St. Louis, March 4th, 5th, and 6th, 1874. The occasion was the thirtieth meeting of the Mississippi Valley Society, which is now the oldest dental organization in existence in this country, and possibly in the world. Its meetings have heretofore, with one exception, been held in Cincinnati, the city of its birth; but the present meeting was voted to be held in St. Louis in connection with the ninth annual meeting of the Missouri State Society. The latter body convened on Tuesday, March 3d, in a preliminary meeting. After the transaction of business, a paper was read from the pen of Dr. F. A. Brewer, Chillicothe, Mo., on the "Proper Treatment of Sixth-Year Molars." He took the ground that there was no justification for sacrificing these teeth, and that all the arguments in the case were in favor of attempting to preserve and render them useful. A brief discussion followed, participated in by several gentlemen, most of whom agreed with the essayist as to the importance of saving these teeth; after which the meeting adjourned.

The joint session convened on the morning of the 4th, at Polytechnic Hall. The gentlemen who were expected to deliver addresses of welcome and response not being present, these were deferred, and the first subject in order upon the programme was taken up for discussion, viz., "The Treatment of the Deciduous Teeth."

Dr. Morgan, of Nashville, opened the discussion. He remarked that the subject is one of primary importance. Our patients often fall into our hands in infancy. He had no *special* treatment for the deciduous teeth, but treated them upon general principles. The file is a more potent instrument in their treatment than in that of the permanent teeth. There is less sensibility of the dentine, and less liability to corrosion after filing; hence the file may be used more freely. When pulps are devitalized, the teeth should be removed. He fears injury to the germs of the permanent teeth by abscess and inflammation around the temporary; an injury is often inflicted in this manner when the permanent teeth are in a formative state, which is never repaired. Has observed spots of defective formation not traceable to any other cause; that these spots result from this local cause is proved by the fact that they appear only on individual teeth, while the results of general inflammation are observed on all the teeth which are in like condition. He has watched special cases until he is satisfied on this point. In more than one case has seen an exfoliation of the alveolus, bringing away the partially-formed crowns of permanent teeth. Incipient decay should be arrested by filing. It is important to preserve the vitality in order to promote absorption,—which action ceases when the tooth is devi-

talized. He had seen an article advancing the sentiment that the practitioner who would remove a temporary tooth ought to be indicted; and inquired if that doctrine was indorsed.

Dr. Kulp, of Davenport, would be willing to disagree with Dr. Morgan in some particulars. He practices saving the deciduous teeth. All points should be looked at. Local inflammation might possibly injure the permanent teeth; but he has discovered no case where it had done so. Why should it injure perfectly-formed enamel? The period of the temporary teeth was an important one in the existence of the child; the teeth were needed for mastication and articulation. In a case where he had been directed by the physician to extract an incisor at four years of age, which was producing abscess, he had opened the cavity and treated the same as he would a permanent tooth, and effected a cure. He had devitalized the pulps in two teeth in the mouth of his little daughter, and when since extracted had found that absorption had taken place; the roots had been filled with os-artificial, and no trouble had ensued. The spots spoken of by Dr. Morgan were to be accounted for in other ways farther back. He should consider that the promiscuous extraction of the deciduous teeth was indictable; or, at least, that the person who practiced it deserved a scolding. He would, however, extract roots.

Dr. Morgan reiterated that there *was* danger, when abscess formed, of injuring the coming tooth, when the enamel was in a formative state; he claimed that the parts where an abscess has existed are never perfectly restored; there is always more or less diseased action; the point of the root is devitalized, and neither that nor the periosteum can be perfectly restored to health; absorption ensues to a limited extent only, where devitalization has taken place.

Dr. Hunter (Cincinnati) asked what becomes of the os-artificial if roots are filled with it, when absorption takes place. Is it good practice to fill these roots?

Dr. Spalding said yes; if twenty years' success is any criterion. Always filled them with gold, and when the time came found the roots absorbed as usual, and the filling remaining, even in the three-rooted molars, the gold yielding to the pressure of the new teeth. Considers it of great importance to retain the deciduous teeth as long as possible. Formation of enamel of permanent teeth commences at an early age, and if inflammation is to work any harm it must be before the lime-salts are deposited. Diseases of deciduous teeth do not usually take place till that is the case. There are other causes for imperfection of the enamel. Children of feeble constitutions and subjects of exanthematous diseases, show it in their teeth; there is danger of attributing it to wrong causes. Absorption is a process independent of the formation and growth of the permanent teeth, and can only be interfered

with by necrosis and disease of the periosteum. The removal of the pulp does not affect it.

Dr. Kulp. May not the cause of eruptive diseases also produce the marks spoken of? may they not be hereditary?

Dr. Spalding. These causes would affect only the general character of the teeth; they would not produce pits; an arrest of growth is an accompaniment of these diseases.

Dr. Morgan. Dr. Spalding has overlooked some points. It is true that eruptive diseases affect the teeth, but when this is the case *all* are more or less marked. There is a class of imperfections that are not the result of any general condition; the crust of the enamel may be properly formed, but underneath is a cloud, which is soft; this is the result of a local cause, and that cause is inflammation about the deciduous teeth. Has found these special results in many cases, and has even prophesied them in advance. General diseases affect all the teeth alike that are in like condition. When vitality is suspended there is very little absorption. The process of absorption is *not* an independent one. Sometimes teeth are not cast at all, for the reason that there is no supply-tooth. Where they are cast early, the permanent erupt early. He had seen a child of eight years with twenty-eight permanent teeth.

Dr. Spalding. To say that the absorptive process is an entirely independent one, would be using too strong a term. The organs of absorption accompany the erupting teeth; the circulatory apparatus of each, however, is entirely separate.

Dr. Hunter asked whether the absorbed material of the temporary teeth goes to assist in the formation of the permanent.

Dr. Morgan had a general idea that nature never uses the same material twice.

Dr. Cushing was glad to hear such experience as that of Dr. Morgan. Experience is invaluable, and also the testimony of those who have practiced filling the roots. Dr. Morgan probably attributes more injury than is really chargeable to the cause named. He thought the enamel would be formed before abscess arises from the temporary teeth.

Dr. Rivers asked if we are to attribute the defective enamel in the second and third molars to the causes named.

Dr. Morgan. No; but he had specimens of exfoliation embracing the permanent teeth.

Dr. Black. Absorption is not hindered by dead teeth, but rather by disease which interferes with the normal process. If the roots and surroundings are kept healthy, the process will advance naturally. This can be done better by filling than by leaving open.

Dr. Rehwinkel. It is not only possible, but probable, that these effects may be produced. We should take a practical as well as a scientific view of this and other matters. He agrees with others as to

the propriety of filling, but suggests that if there is any case where the operation of Hullihen is admissible, it is in the deciduous teeth. It is almost impossible to restore perfect health where abscess has occurred; there is always a weak point. It is a contradiction to the laws of nature, which we violate by devitalization. Nature consents to this, but the periosteum is overtaxed, and there is often rebellion. The point of the root is bare. Temporary teeth can be made useful for a long time, by removing all remains of the pulp, and saturating with carbolic acid, and leaving the safety-valve of Hullihen. Filling deciduous teeth is not a desirable business; there is neither money nor pleasure in it.

Dr. Keely. The profession is a unit as to the importance of saving the temporary teeth during the natural term. There is great difficulty in getting control of the patients. He does not always fill with gold; uses oxychloride, amalgam, and tin-foil. At $2\frac{1}{2}$ years of age he had filled a superior molar with amalgam and an inferior with gold; they remain now at 9 years. The temporary teeth should remain as long as possible; if they are extracted too soon, the regularity of the arch will be interfered with.

Dr. Wells asked what could be done in a case where the temporary teeth are loosening at $2\frac{1}{2}$ years. He could give no advice. The patient had an enlargement of the spine, but whether it was connected with the other phenomenon he could not say.

Adjourned.

AFTERNOON SESSION.—At 2 P.M. the societies met for the purpose of hearing the address of welcome by Dr. Spalding, and the response by Prof. Taft. Dr. Spalding occupied an hour in a well-studied effort to impress his hearers with a proper appreciation of the present and future advantages of the city of St. Louis. He reviewed its progress from an unimportant trading-post to the great city of the present day; and entered into elaborate calculations to show its future rate of increase, as deduced from that of the past, and of other great cities; and even fixed the population for the year 1900. He settled it to the satisfaction of the St. Louis portion at least, of his hearers, that that city is the center of the United States, if not of the world; and that when her railroad system and her bridge were completed, her growth would be marvelous; he entered into details in regard to the bridge, which he said was regarded as having no equal as an achievement of engineering skill upon the globe. Exactly what these things had to do with dental science or the joint meeting of the two societies, was not so apparent; but at the close, Dr. Spalding gave as his excuse for diverting the thoughts of his hearers into channels so entirely non-professional, the fact that his experience had taught him that the details of manipulation so constantly occupy the dentist's time and exhaust his

energies, that he is apt to confine himself so closely to the study and practice of his profession as to exclude from his mind the proper consideration of subjects of a more general nature. The lawyer, the clergyman, the artist, the physician, have each their leisure hours to devote to matters not strictly belonging to their respective professions; but the dentist, tied down to the daily routine of professional duties, and shut up mainly within the narrow limits of his office, needs to be drawn into the contemplation of those things which pertain to the general interest of society and the world.

Prof. Taft responded in a very happy impromptu effort. He was gratified at the spirit of welcome extended. Although the Mississippi Valley Society was away from its home and its birthplace, it was yet among friends. These they would find wherever they went; for its members had gone out all over this broad land, from the east to the west, from the north to the south; and across the wide ocean. He paid a touching tribute to the memory of those who had met with them, but were now no more; and complimented the society, existing while others having fulfilled their purpose had ceased to be; and concluded, "Long live the Mississippi Valley Dental Association and the Missouri State Dental Association; long may they live, perfect, efficient, and powerful, and with a widespread influence."

The subject under discussion at the time of adjournment, viz., "The Treatment of Deciduous Teeth," was then taken up.

Prof. Taft said that a more proper stating of the subject would be the *management* of the deciduous teeth. *Treatment* implied disease; and it was quite as important to preserve organs in a state of health as to restore health when it was absent. What shall be done to secure and maintain good temporary teeth? We ignore hygiene, which is the great question; every dentist should make it a point to imbue the patient with an understanding of what is required to secure the best teeth. Most content themselves with simply treating diseases instead of giving instruction. We not only need instruction ourselves, but stimulation to use what knowledge we have. Give mothers hygienic rules for taking care of the teeth previous to and after their eruption. Cleanliness is important; systemic treatment accomplishes much. The general systemic condition influences the state of the teeth. If we simply confine ourselves to the treatment of diseased teeth, we merely lop the branches of the upas which we should cut up and destroy. Temporary teeth are neglected by mothers, and dentists, and doctors; and the only wonder is that they do not melt away like wax. A disgustingly filthy condition is often found; it is criminal carelessness to neglect them till such ruin is wrought, while every care is taken to provide playthings and dress, to the neglect of the teeth, and perhaps the health. The treatment or filling is a secondary consideration compared to prevention.

When this ruin is wrought the permanent teeth become involved; there should be no pulpless temporary teeth. There is danger of encroaching upon living tissue in filling roots of the temporary teeth. The pulp should be removed; all accumulations should be neutralized. We may injure the delicate tissue below by medicaments. Objects to carbolic acid in ordinary cases used so as to pass through the foramen. Use an antacid. No gold or metallic root-fillings are admissible; use Hill's stopping or a similar material; metal interferes with absorptive action, and disease follows its use every time. Care should be taken not to interfere therapeutically or mechanically with this process. Wood, etc., for roots, is also wrong.

Dr. Crouse, in response to a remark, explained that he had never condemned amalgam in temporary teeth. It is about as good a material as can be used. He fears that some may be confused and apprehend that no more permanent teeth will be formed. One says, keep all the teeth in the mouth and fill all the roots; another would not fill any roots. What conclusion are we to come to? The treatment of the deciduous teeth is simple: file the front teeth and fill the back teeth with oxychloride if the pulps are exposed. Has seen any number of permanent teeth which had not been injured, although in connection with roots of diseased deciduous teeth.

Dr. Dean would extract temporary teeth when giving trouble, and not otherwise. He had supposed that the pulp could not be destroyed without destroying the absorbent papilla, and that a dead tooth could not be absorbed physiologically. There is no demonstrative evidence that bone phosphates are reappropriated, but that they *can* be is well established; and if they are needed, there is analogically no reason against it.

Dr. Morgan asked to be pointed to a case of absorption and re-appropriation.

Dr. Dean referred to Draper.

The subject was then passed and the next taken up, viz.: "Will Legislative Enactments prevent those who lack the Necessary Qualifications from entering the Dental Profession?"

Prof. H. A. Smith read a paper on this subject, which was followed by discussion as follows:

Dr. Crouse. Proof is ample that a reform is needed. The law now before the Illinois legislature applies to no one now in practice; he would like to go back of that, and get a law that would prevent men from picking boys up out of the street and turning them out dentists in a year or less. The Illinois State Dental Society had adopted a by-law that no member should take a student for a less term than three years, nor without a written obligation that he should become a graduate.

Dr. Rehwinkel gave some interesting facts as to legislation by absolute governments. In the kingdom of Hanover the University of Göttingen is situated, which is modeled after the English system. At sixteen he was apprenticed to a surgeon, who, though he had not the title of "Dr.," was allowed to perform all operations. The next grade is allowed to practice minor surgery, but must not administer medicaments. A doctor of medicine is required to pass a state examination in addition to that of the faculty, and very nearly becomes a state officer. These laws were established without regard to their acceptability to the people, solely to protect the public and prevent imposition. This sort of distinction applied not only to the professions, but to all trades. A carpenter was not permitted to use a plane on the outside of work; if he did, the joiner would have him enjoined. Though the laws had been abolished upon the consolidation of Germany, and it was almost as free as in this country, yet the distinctions still existed. Their experience in Ohio had shown that it was impossible to deny that the results of legislation were good.

Prof. H. A. Smith thought he had discussed the subject practically. He thought they had rather overreached themselves in Ohio in procuring the enactment of such a stringent law (*viz.*, one which requires all practitioners to present themselves before a board for examination). They had not tested the enforcement of the law, and he doubted whether it could be enforced. We must take a practical, common-sense view of it, and look to the future entirely. He would not require graduation. In this day a man can qualify himself without colleges; there are many self-educated dentists who are entirely competent.

Dr. Keely said the Ohio law had done good. He knew of instances where men had come forward a first and second time, and failed, and finally had passed a creditable examination. They had made a mistake in Ohio in applying for too much. Their policy should be to make every man a friend of the law. But, as it stands, it has done an immense amount of good; men who have always remained at home have come out and attached themselves to societies.

Dr. C. S. Smith, of Illinois, spoke of the law which was now before the legislature of that State. For some years they had made a persistent effort to secure its passage, and were now, he was glad to say, apparently upon the point of success; he hoped and expected that the bill was about to become a law.* It was, however, purely prospective in its operation, referring to no one now in practice, but merely requiring that future applicants for admission into the ranks of the profession should be graduates, unless they came from other States, when they

* We regret to be obliged to add that this bill was defeated in the Senate by a few votes, it happening to come up when the house was thin.—REPORTER.

would be subjected to an examination by a board of examiners. Living as he did at the seat of government, and being cognizant of all the efforts made to secure the passage of this bill, he was pretty well acquainted with the popular objections to such laws. A previous speaker had remarked, in reference to the laws of Germany, they were established by an absolute authority, without reference to their acceptability; but in this country it was entirely different. Ours was a government of the people and *by* the people, and it was notoriously impossible to secure the enforcement of any law which did not meet popular approval. It was difficult to convince the people that they needed any protection, and that that was the object aimed at. The reply was always ready, that the people were abundantly able to protect themselves, and that if they chose to employ quacks, they alone would suffer, and it was nobody's business. These laws were said to partake of the character of sumptuary legislation, and not in accordance with the genius of our free institutions. Even the mild measure they had in view was assailed upon its passage by cries of "monopoly;" "a corner in dentistry;" "an arrangement whereby the big fish could swallow the little ones," etc. These obstacles they had had to encounter, and always would have to; any stringent regulations would very probably raise the cry of persecution, and defeat their own ends; and he was and always had been opposed to trying to get such a law enacted. He believed that the law would be productive of good, and especially that its moral influence would be very beneficial in inducing proper preparation on the part of new recruits.

Prof. Taft corroborated the statements of good results from the Ohio law, in various ways. The attention of the people has been called to the subject by means of the talk it has occasioned. It is found that intelligent people indorse the objects of the law. It has had a good influence on members of the profession now in practice. There is no increase of incompetent men; the turning out of boys as dentists in a few months is all abated; the reproduction of the quack element is arrested. The tone of the profession has been coming up; men have spent several years in studying; those not called upon by the board have volunteered for examination. Quacks have been weeded out, and have left the State. There are more in attendance at the meetings of the State society. The moral influence of the law is its greatest efficiency. The original law called for ten years' practice or an examination, but the legislature modified it to five.

Dr. Rehwinkel said there were 480 dentists in Ohio, of whom 100 were graduates; 150 had come before the board. Agreed with Prof. Taft as to the moral influence of the law.

Dr. Bancroft, of Ontario, Canada, spoke in regard to the legal enactments in that Province in reference to dentistry. The law has been

enforced for some years. It divides all practitioners into three classes : those having been five years in practice were not required to pass an examination ; those who had been less than that time in practice were required to pass the board of examiners ; while students were required to "matriculate," which means more than in this country. The law was a complete success. Previous to its enactment there had been no associations in existence ; now there were several. Dentists from America say it is the best law they know of. Dentists from other countries must go before the board, whether graduates or not.

Dr. Richardson, of Indiana, said that they had made several attempts to get a law in Indiana, but had met with no success. There were peculiar difficulties to meet, for in Indiana the practice of all professions was entirely free ; and there were popular objections to any restrictions. He had formerly been in favor of such laws, but now he was opposed to them ; his reasons being that they had a law in Ohio, on one side of them, the effect of which had been to drive the Ohio quacks into Indiana. It now appeared that they were about to get one in Illinois, on the other side of them ; and then they will be sandwiched in between two States having dental laws, and will be perfectly overrun with quacks. So, until there was some prospect of getting a law in Indiana, he was opposed to dental laws ! (Laughter and applause.)

Subject passed.

Adjourned.

(To be continued.)

MEETING OF THE ALUMNI OF THE PHILADELPHIA DENTAL COLLEGE.

A MEETING of the Alumni of the Philadelphia Dental College was held in one of the lecture-rooms of the college, on Friday morning, Feb. 27th, 1874, at 10 o'clock A.M., and was called to order by the President, Dr. Wm. A. Breen, of Philadelphia.

The committee on constitution and by-laws presented a new code of laws for the government of the body, which were unanimously adopted.

The death of four of the Alumni during the past year was announced, viz., Saxton P. Martin, M.D., of Massachusetts, class 1865-6 ; Henry W. Ladd, of Maine, class 1868-9 ; William S. Shields, of California, class 1869-70 ; and Samuel B. H. Faught, of Georgia, class 1872-3. Resolutions of respect to their memory were passed.

Dr. Marshall H. Webb, of Lancaster, Pa., presented the following preamble and resolution, which were unanimously adopted :

WHEREAS, Recognizing the devotion to dental education manifested by the Faculty of the Philadelphia Dental College from the origin of the institution up to the present, not only in faithfully performing their

duty as instructors but also in contributing freely of their means to provide the necessary specimens, apparatus, etc., demanded for the thorough impartation of theoretical and practical instruction, and believing that such specimens, apparatus, etc. (costing in the aggregate over \$13,000) should be the property of the trustees of the college, and placed in a building erected for the purpose, thereby enlarging the sphere of usefulness and insuring the perpetuity of our Alma Mater; therefore,

Resolved, that a committee be appointed to take such steps as may be best calculated to secure an endowment fund looking to that end.

The following is the committee appointed to solicit contributions from the Alumni, members of the dental profession, and other liberal persons who may feel inclined to aid in this movement: Dr. Marshall H. Webb, chairman, Lancaster, Pa.; Dr. James McManus, Hartford, Connecticut; Dr. Wm. H. Waite, 10 Oxford St., Liverpool, England; Dr. J. Lehman Eisenbrey, Philadelphia, Pa.; Dr. George W. Stoddard, Belfast, Maine; Dr. George H. Chance, Salem, Oregon; Dr. George B. McDonnell, Conneautville, Pa.; Dr. Alfred P. Merrill, New York City; Dr. Samuel J. Dickey, Thirteenth Street below Arch, Philadelphia, Pa.; Dr. James B. Willmott, L.D.S., Toronto, Canada; Dr. John Murray, Rochester, Pa.; Dr. Adolf Petermann, 6 Rossmarkt, Frankfort-on-the-Main, Germany; Dr. Wesley J. Chandler, Zanesville, Ohio.

An election for officers to serve during the ensuing year was held, and resulted as follows:

President.—Dr. J. Lehman Eisenbrey, Philadelphia.

Vice-Presidents.—Dr. Alonzo Boice, Philadelphia; Dr. M. H. Webb, Lancaster, Pa.

Secretary.—Dr. Ambler Tees, Philadelphia.

Corresponding Secretary.—Dr. James McManus, Hartford, Conn.

Treasurer.—Dr. W. A. Breen, Philadelphia.

Executive Committee.—Dr. J. P. Wyman, Philadelphia, Dr. J. H. McQuillen, Philadelphia, Dr. M. L. Long, Philadelphia.

MISSOURI DENTAL COLLEGE.

THE eighth annual commencement of the Missouri Dental College was held in Temple Building, St. Louis, on Thursday, March 12th, 1874.

The valedictory address was delivered by Charles N. Litton.

The number of matriculates was seventeen.

An address was delivered by Dr. J. J. McDowell.

The degree of D.D.S. was conferred upon the following members of the graduating class:

NAME.	RESIDENCE.	THESES.
Oliver Milham.....	Missouri.....	Fracture of the Inferior Maxilla.
Joseph A. Fisher.....	Austria.....	Caries of the Teeth.
Morgan Adams.....	Arkansas.....	Anæsthesia.
Briggs J. Fuller.....	Illinois.....	The Deciduous Teeth.
Martin A. Bartleson.....	Missouri.....	Diseases of the Gums.
A. C. McFall.....	Texas.....	Treatment of the Mouth preparatory to inserting Artificial Teeth
M. S. Hudson.....	Missouri.....	The Teeth and their Diseases.

ILLINOIS STATE DENTAL SOCIETY.

THIS organization will hold its fourth annual session at Jacksonville, Ill., on Tuesday, May 12th, 1874. A cordial invitation is extended to all dentists to attend.

CHARLES R. E. KOCH,
Secretary.

BIBLIOGRAPHICAL.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION AT THE THIRTEENTH ANNUAL SESSION, HELD AT PUT-IN-BAY, COMMENCING AUGUST 5TH, 1873. PUBLICATION COMMITTEE: M. S. DEAN, G. H. CUSHING, H. A. SMITH. Chicago, 1873.

THE publication committee are certainly entitled to the credit of placing the Transactions of 1873 in a most agreeable form. The volume before us is a fine specimen of the typographical art, and the paper of exquisite softness and tint. As thus presented it is a book of permanent value, and should be in the library of every practitioner. It contains the record of the business transactions of the session, all the papers read, and the discussions which followed.

The report on Dental Histology and Microscopy is illustrated by nine photographic plates, each on a full page, of magnified sections of jaws, teeth, etc.

The volume can be obtained of Dr. M. S. Dean, 550 Michigan Avenue, Chicago.

Price, in muslin, tinted paper, with histological illustrations, \$2.00. On white paper, paper cover, without the illustrations, \$1.00.

A TREATISE ON THERAPEUTICS: COMPRISING MATERIA MEDICA AND TOXICOLOGY, WITH ESPECIAL REFERENCE TO THE APPLICATION OF THE PHYSIOLOGICAL ACTION OF DRUGS TO CLINICAL MEDICINE. By H. C. WOOD, JR., M.D. J. B. Lippincott & Co., Philadelphia, 1874.

No department of medical knowledge has been less deserving the name of science than the practice of therapeutics, for, though the effects

of medicines may have been well understood, their *modus operandi* certainly has not been.

Therapeutics is much more advanced as an art than as a science, its practice being largely empirical ; and, though it may be assumed to be in a better position to-day than ever before, it will not bear comparison with any other branch of medicine, because of the more rapid advance of all the others.

Diligent, long-continued, intelligent observations of great value are being made in regard to most of the therapeutic agents known, and their adaptation to the cure of pathological conditions ; but the facts, when evolved, are accounted for on various and not unfrequently opposing theories. A certain medicine is recognized by some practitioner as being of value in the treatment of a given disease. The fact being announced, others make the experiment with similar results, and presently the administration of the said drug becomes the conventional treatment for that disease ; but the reasons for its administration—the explanations of the rationale of its curative effects—are often ludicrously and hopelessly at variance.

Facts, though empirical, cannot fail of being acceptable and useful ; but no array of facts, no emphasis of results, no utterances of authority, can constitute a science. What is needed is to have the significance of the facts unfolded—the principles which underlie them manifested. Until therapeutics is made a science by a correct appreciation of the *action* of remedies, routinism will continue to be the curse of the profession. To know *what* will give relief in a diseased condition is well ; but this is the *art*. To know *why* is the *science*. Until all medication is based upon a knowledge of the philosophy of cure, the practice of therapeutics must be empirical.

Thanks, then, to the few earnest, painstaking men whose ambition it is to place this department of medicine on a scientific basis, and give to the profession a truly rational system of medication.

To contribute to an understanding of the mode in which drugs introduced into the animal economy produce their peculiar effects, to explain the physiological action of remedies, is the purpose of the volume before us.

Those who desire simply to know in what diseases any given drug is advised, will find in any of the standard treatises on *Materia Medica* the information they seek ; but those who crave a knowledge of the rationale of their employment will find more of philosophical discussion of their mode of action in this volume than in any other book in the language. We would not be understood as implying that our author ignores clinical facts ; on the contrary, all the important views advanced are supported by a most liberal reference to such facts ; but the distinguishing feature of the book is the effort to systematize, accord-

ing to a new arrangement, the general principles on which medicines operate, and thus to assist in a truly scientific understanding of their administration to meet the indications of pathological conditions.

The volume gives evidence of diligent research into the literature of experimental pharmacology, and presents whatever of value has been evolved by recent investigations of others, as well as by those of the author, whose original work, by the way, has furnished no mean addition to a scientific and methodically-connected classification of remedial agents, tending toward the establishment of therapeutics as an art upon a scientific basis.

The author has aimed to construct a *system* of therapeutics based on observed clinical facts. How many of the facts are false, and, per consequence, the theories based upon them, time, which trieth all things, will determine. The effort, however, to establish therapeutics on a scientific basis, by carefully-constructed hypotheses, based on faithful observation and experiment, must contribute to the advancement of knowledge in the ascertainment of the specific action of remedial agents.

The work must prove valuable to all "anxious inquirers" after the *principles* of medicine.

EDITORIAL.

A HISTORY OF AMERICAN DENTISTRY.

A NEW YORK publishing house announced, some months since, as in course of preparation, a History of American Dentistry and Dental Surgery, comprising Biographical Sketches of American Dentists, with Portraits on Steel.

The proposed volume has met with expressions of decided disapproval from many of the most prominent dentists in the country, and with like expressions from several dental societies.

The action of the Association of the Alumni of the Pennsylvania College of Dental Surgery will be found in the report of the proceedings of that body, in the current number of the DENTAL COSMOS. The Odontographic Society of Pennsylvania, at a meeting held April 2d, 1874, unanimously adopted the following resolution: "This Society views with disfavor the publication of biographical notices in a work entitled 'A History of American Dentistry and Dental Surgery, comprising Biographical Sketches of American Dentists,' and regards such notices as personal advertisements rather than contributions to biographical literature." The Boston Society for Dental Improvement, at a meeting held March 10th, 1874, adopted resolutions embodied in the protest which we append.

These resolutions and protest require no comment. The opinion of so many men who are interested in maintaining the good name of the dental profession is certainly entitled to respect. If we are to have a history of dental surgery, it should be the product of some one mind thoroughly competent and unprejudiced—a book which should rely upon its merits as a veritable history:

Whereas, It has been proposed by a certain publishing company to publish a History of American Dentistry and Dental Surgery, comprising Biographical Sketches of American Dentists, We, the undersigned, desire to express our disapproval of the same for the following reasons: Instead of exalting our specialty, it would weaken its position in the minds of educated members of the community. It would compromise us in the estimation of professional gentlemen, and subject us to just criticism for indulging in a species of self-adulation and personal advertisement. It would offer the opportunity for men whose professional attainments are inferior, to gain notoriety at the expense of those more deserving. While we have no objection to a well-executed history of dental surgery, confined to no country, and including its whole development, we cannot but look with disfavor upon a book which would be so fruitful of the above evils. Finally, we hope, above all, to protect our profession from such charlatanry.

Dr. W. H. Atkinson, New York.

" O. A. Jarvis, "
 " F. N. Seabury, "
 " C. E. Francis, "
 " Wm. Carr, "
 " W. A. Bronson, "
 " Benj. Lord, "
 " E. A. Bogue, "
 " A. L. Northrop, "
 " R. M. Gage, "
 " H. W. Hawes, "
 " S. G. Perry, "
 " W. H. Allen, "
 " John T. Metcalf, "
 " Chas. D. Cook, "
 " O. E. Hill, "
 " H. G. Mirick, "
 " C. A. Marvin, "
 " A. H. Brockway, "
 " T. H. Chandler, Boston.
 " E. G. Leach, "
 " E. Blake, "
 " J. T. Codman, "
 " G. T. Moffatt, "
 " T. O. Loveland, "
 " T. B. Hitchcock, "
 " S. F. Ham, "
 " T. L. Buckingham, Philadelphia.
 " W. F. Litch, "
 " C. J. Essig, "
 " W. C. Head, "

Dr. E. R. Pettit, Philadelphia.

" F. M. Dixon, "
 " J. H. McQuillen, "
 " M. Kirk, "
 " J. Truman, "
 " C. A. Kingsbury, "
 " A. Boice, "
 " E. H. Neall, "
 " M. H. Webb, "
 " R. Huey, "
 " W. G. A. Bonwill, "
 " D. D. Smith, "
 " E. T. Darby, "
 " J. Foster Flagg, "
 " C. N. Pierce, "
 " Louis Jack, "
 " G. T. Barker, "
 " S. Dillingham, "
 " T. C. Stellwagen, "
 " D. Roberts, "
 " I. S. Fogg, "
 " J. L. Eisenbrey, "
 " E. L. Hewitt, "
 " S. S. Nones, "
 " W. H. Trueman, "
 " G. B. McDonnell, "
 " E. Y. Webb, "
 " E. Wildman, "
 " J. S. Gilliams, "
 " G. W. Ellis, "
 " C. E. Pike. "

PERISCOPE.

SCIENTIFIC THEORIES AND PROCESSES.—What do we understand then by the term "science"? It simply means, in its most comprehensive sense, knowledge; in its ordinary sense, it denotes knowledge reduced to a system, that is, knowledge arranged in a regular order, so as to be conveniently taught, easily remembered, and readily applied. In the first place it demands the most complete verification of facts; each fact must be most carefully examined, and all its bearings and relations with other facts studied and accurately noted. It then arranges, groups, and classifies the facts in accordance with their natural relations, and lastly, deduces by the ordinary processes of reasoning the general principles, or laws, which bind the facts together; these principles, or generalizations from the carefully studied facts, being what we term scientific "hypotheses," or "theories." This is all that science consists in: simply a more careful exercise of the same faculties, the same modes of reasoning we employ in the affairs of every-day life. Astronomy, geology, botany, zoology, chemistry, are all constructed upon this simple principle of observing facts, arranging and classifying these facts, and noting their relations and dependencies. If the facts are few, and of such a nature that they can be easily observed in all their bearings and their relationships readily demonstrated, we have a more or less "exact" science. If they are numerous and complicated, and all their bearings not easily seen, we have an incomplete science. To this latter class most of the sciences belong; and we find that neither astronomy nor chemistry, geology nor zoology can lay claims to absolute certainty. In each of them are many but partially known facts; new observations are every day adding to the stores of our knowledge, and consequently shifting the boundaries of these divisions of nature.

To this class also belongs medicine. Based as it is upon anatomy, chemistry, physiology, pathology, and therapeutics—each of them incomplete sciences—how can we expect that *certainly* can pertain to her? When we are reproached with the uncertainties of medical science, and are pointed to the constant changes occurring in her theories and practice, how absurd then to attempt to deny them! Just as all of the physical sciences are changing and advancing, just so with medicine. Just as they all have been again and again turned from the true line of progress by the wild theories and speculations of dreamers and enthusiasts, so has the bane of medical science ever been hasty generalization, leading to false notions of practice. And like the others, she invariably returns to the patient observation of facts; and the general tendency is ever onward to a close approximation to truth.—*Valedictory Address of Prof. E. L. Howard.*

PROFESSIONAL EDUCATION.—The complaint is very general, especially among students, that the curriculum is absurdly extended and entirely out of place in dentistry. The average student can see no grand results in cell-doctrine, nor can he build a practice on comparative anatomy, nor can he see any money in the muscles of the lower extremities, nor patients in *Materia Medica*, nor common sense in the nomenclature of chemistry; but he can see very much in filling and placing teeth. These are his Alpha and Omega, and this his idea of dentistry. It would not

seem to require much time, or large and elegant surroundings, to impart this. We do not so understand it, and you who think this will not so understand it when you have settled down to the duties of your profession. Dentistry, as I before remarked, embraces a portion of almost every science. It is a conglomerate, based on the wants of men. Being this, you must necessarily bring to bear upon it all the knowledge possible, and to do this you must first acquire it. If there was no such thing as use in connection with it, the fact still remains that a professional man without general intelligence is a walking absurdity—a disgrace that admits of no excuse—a fraud upon a confiding public that needs exposure.—*Prof. Truman, Introductory Address Pennsylvania Dental College.*

PROFESSIONAL EDUCATION.—We can suggest no improvement in the present system of professional education, if properly carried out and faithfully illustrated by our college faculties; it is true, that expressions of dissatisfaction have lately been heard concerning the management of our schools, and the conduct of our “faculties of instruction.” There may be faults and delinquencies, and there *are* imperfections which are common to all human enterprises that attach to dental colleges, but it cannot be denied that they are institutions of inestimable value, that they have done more than all other agencies combined, to give to dental surgery its present status among the liberal professions and its present consideration and esteem in society. And further, it cannot be denied or gainsayed that our professors and college faculties have been generous, laborious, and self-sacrificing, and, as a general thing, are an unrequited and uncompensated set of men. Whatever faults or imperfections may now challenge our criticism, dental surgery owes a debt of gratitude to these institutions which has never yet been paid. The period of pupillage may be too short—we think it is; the standard of proficiency for graduation may be too low; the struggle for sustaining patronage (owing to an unfortunate competition, incident to the unwise multiplication of colleges) may have given ground for some of the strictures and animadversions these schools have received. But admitting all that has been charged, it is simply an *abuse*, which in nowise touches the principles or impairs the system upon which these institutions were founded; and we may rest assured that whatever errors or imperfections may now exist will be speedily corrected by a wholesome professional sentiment, which no school can resist and live. Our colleges *must* meet the demands of the age, or go down and be succeeded by others in harmony with the times, and measuring up to all the duties and responsibilities of advanced and advancing science.—*Dr. W. W. H. Thackston, before Virginia Dental Association.*

IMPORTANCE OF PHYSIOLOGICAL INVESTIGATION.—The chief duty and most important office of the dentist is to *save* the natural teeth, and if we knew *exactly* what caused decay and destruction of these organs, and precisely and certainly how that cause operated in all cases, with our present knowledge and resources, it would be a *short* step to discover the means of counteracting that cause, and preventing its ravages in dental tissue. But with all the labor and all the research, with all the aids of advanced physiology, of analytical and synthetical chemistry, with all the wonderful revelations of the microscope, the cause and methods, so to speak, of decay of the natural teeth remain an un-

determined and perplexing question. One will tell you that this cause is local; another, that it is general or systemic; one, that it is external; another, that it is internal; one, that it is mechanical; another, that it is chemical; and still another, and we think a more rational theory, is, that it is chemico-vital; one, that it is acids; another, that it is alkalies in the oral and buccal secretions, and more recently, the disclosures of the microscope would seem to warrant the conclusion that animal and vegetable parasites, animalculæ and infusoria, play a very active and decided part in the process of dental disorganization and decay. I merely mention this single example, lying upon the very threshold of our specialty of science, as an illustration of the necessity for continued and persevering effort on the part of all who would achieve excellence as dental surgeons; and the stupidity and folly of any man in our profession who would persuade himself that he knows enough to cease his labors, and rest upon his present attainments. But the timid and the weary ask, What chance is there for us? What need of our worrying our brains with that which has baffled the efforts and defied the research of scientists for a century or more? Why, simply this: that every step is an approach to truth, though in itself a failure, though disappointment may result, and though we may at times appear in a certain sense to be wandering away from the object sought; in another, and *stronger sense*, every additional step is an approach to the desired end, upon the principle or the philosophy of the hunter, whose flagging companion, after beating the fields and finding no game, urged the abandonment of the hunt. "No," said the keen old sportsman, "I know there *are* birds; we *now* know they are not in these fields; let us look elsewhere, and we will find them." We know that human teeth decay, and myriads of these invaluable organs are annually lost; we have beaten many fields in the vain pursuit of the cause of that decay and loss; let us now look elsewhere, and continue the search till success rewards our diligence and perseverance, and we finally reach a solution of this great and important problem.—*Dr. W. W. H. Thackston, before Virginia Dental Association.*

ARTIFICIAL FEEDING OF CHILDREN.—*Nursing by the mother* is the *only* natural feeding, and it cannot be substituted by any other with safety to the health of either the mother or child, except under the conditions dwelt upon in detail in our first article. So important is the healthy mother's milk, that "mixed nursing" is to be preferred to wet-nursing. The most appropriate food to be given with nursing has been indicated in preceding articles. In regard to wet-nursing, but little need be added. It is to be resorted to when the mother's milk is not suitable, and when a proper wet-nurse can be obtained, but from the lax condition of morality in these times, and the desire for gain at all hazards, it is a difficult matter to procure a healthy, honest, even-tempered wet-nurse, with plenty and good milk. To the poor it becomes a luxury, and they cannot resort to it, even to save their children's lives. A well-regulated system by which suitable wet-nurses can be procured at reasonable prices is yet to be inaugurated.

The so-called "prepared foods" with their flaming advertisements and testimonials, oftentimes spurious, and accompanied, as in one instance, by the picture of a wonderful baby "brought up entirely on this and no other food"—all of these originate in a desire to meet the

wants of children deprived of mother's milk, and often stand in the way of the mother's duty of nursing.

The country is flooded with them. Some are harmless, many dangerous, and a few useful. The thoughtless indorsement of physicians is sadly to be deplored. A *perfect* substitute for mothers' milk has never yet been made, and I doubt whether it ever will be. An exact analogy in solid and fluid constituents cannot take the place of human milk, with its inherent, unexplainable, life-giving principle.—*Dr. Jerome Walker, Sanitarian for April.*

ON THE MERITS OF ADHESIVE GOLD AS A FILLING.—We undoubtedly owe Mr. Fletcher some acknowledgment for his communication in the last number of this Journal, in which he proves almost conclusively that non-adhesive gold forms a more perfect filling in those cases in which it can be used, than does the adhesive form of gold.

His experiments can, however, hardly be considered as quite conclusive, as he has only tried them on his own fillings, and perhaps he may not be so skillful in the use of adhesive as he is in that of non-adhesive gold.

I think, moreover, that the results at which he has arrived can scarcely be considered as unexpected, since this defect of adhesive gold plugs has been pointed out to me more than once, by those who habitually use non-adhesive foil; and is it not what one would expect to find when the two modes of filling are considered? For what is there to keep the adhesive fold in close contact with the walls of the cavity?

There is certainly no adhesion between the gold and the dentine; hence the necessity for drilling retaining points, to fix the first portions of gold.

There can be no wedging action, for the gold already in the cavity is, or should be, too solid and too firmly fixed *in situ* to admit of it. In wedge-fillings the whole of the filling is pressed into place, and forced against the walls of the cavity by the last few strips of tape, and on these it entirely depends; so much so, that in large and proximal cavities the cylinders have to be held in position until the tape is introduced. Whereas, in adhesive gold plugs, the first piece of gold is the all-important one, each successive piece depending upon the solidity and immobility of its predecessor, not on its adhesion and close adaptation to the wall of the cavity nor to the wedging that is to follow, but to its cohesion to the previous piece or to the retaining points; and there is really nothing to keep a piece of adhesive gold against the wall of a cavity where you placed it, beyond its cohesion to the portion of gold already in the cavity.

It is possible to conceive when a portion of adhesive gold is pressed against the wall of a cavity that it remains there, held in position by its adhesion to the retaining portion of gold, and by its hardness and absence of elasticity. But it is also possible that it may move or give a little after the pressure of the instrument is removed, the tendency being for the edges in contact with the walls to incline or curl in towards the retaining portion of gold to which alone it can adhere. And if this does occur, there is little hope that the pressure used on the succeeding portions of gold will replace it perfectly in its position.

Again, that perfect solidity of an adhesive filling, which enables it to be rolled out into a sheet, deprives it of that elasticity which would

compensate for any sudden contraction which undoubtedly occurs under the effect of cold.

I am sorry that Messrs. Ash do not succeed in making a perfectly non-adhesive gold-foil; for it is only with a perfectly non-adhesive foil that you can hope to obtain an elastic filling, and be enabled to make the wedging in the center of the filling tell perfectly on the cylinders at the circumference.

I think that adhesive is a very tedious and somewhat unsatisfactory form of gold to employ, and although the adhesive gold plug is more solid and capable of a finer finish than the non-adhesive, it is wanting in elasticity, and is rarely in perfect contact with the walls of the cavity.

—*John Fairbank, M.R.C.S., in British Journal of Dental Science.*

EXCISION OF ONE-HALF OF THE HARD PALATE FOR THE REMOVAL OF AN ANGEIOMA.—Mary McK., six years of age, from the State of Wisconsin, was attacked about eighteen months ago with frequent hemorrhages from the mouth, proceeding from the gum between the molar teeth on the left side of the upper jaw, and which were at times only arrested by the application of styptics.

About a year ago an operation was performed, which proved ineffectual, for, within the past few months, bleeding has recommenced and the tumor has been gradually increasing in size, accompanied with pain in the cheek and ear, but without any recurrence of nasal hemorrhage.

This tumor is an angioma, resembling the *nævus* that occurs in the skin, but is not an aneurism by anastomosis, which is occasionally developed in connection with the upper jaw and in the maxillary sinus, because it does not exhibit pulsation synchronous with the beat of the heart. It is impossible to determine whether or not this growth involves the antrum, for, although there is apparently no complication of the nasal cavity, the tumor may entirely fill the antrum of Highmore and be encroaching upon the nares.

An incision is made from the commissure of the lips, extending about three inches outwards towards the ear, in such a manner, however, as to preclude the occurrence of injury to the facial nerve and the duct of the parotid gland. This external wound is rendered necessary by the size of the tumor, the removal of which through the mouth would be impracticable. The facial artery, which has been divided, is secured by a ligature, and the flap dissected back to give sufficient room for the performance of whatever operative procedure may be required to extirpate thoroughly the morbid growth.

This disease appears to involve the palatine process both of the superior maxillary and the palate-bone on the left side, but without having invaded the antrum of Highmore; and therefore the excision of half of the roof of the mouth will be necessary to effect complete removal of the diseased structures. In order to accomplish this, the bone-forceps are introduced—after the incisor teeth have been extracted—into the anterior nares and the mouth, to cut through the alveolar process and the hard palate near the median line, and, when this has been effected, are again applied so as to separate the palatine process from the body of the maxillary bone.

There is considerable hemorrhage, resulting from the division of the posterior palatine artery and the numerous smaller vessels in this situation, which will be controlled by applying styptics and plugging

the antrum with cotton saturated with subsulphate of iron. If bleeding from the posterior palatine artery persists, it can be arrested by the application of the actual cautery; for the ligation of the vessel, situated as it is, so far back in the mouth, would be impossible.—*Clinic of Prof. Gross, Jefferson Medical College, in Philadelphia Medical Times.*

DENTISTS AND BLACKSMITHS.—In a recent number of the *Saturday Review* we find a capital article on dentistry, from which we cull the following passage with regard to the progress of the art since the day when blacksmiths were its practitioners:

"Certainly, a good dentist deserves to be called the friend of man. And therefore we read with pleasure in the *Medico-Chirurgical Review* that during the last ten years no branch of surgery has made so much progress as dentistry has done; for, during many dark ages, with respect both to science and to practice, it was in a very backward state. Not very long ago, it is averred, blacksmiths were much in favor as operators in this department—a fact which seems to require explanation. It will perhaps be surmised that they were recommended for their work by their great bodily strength. But the obviousness of this account of the matter is delusive; the true theory must be sought in a more roundabout way. And if, in the first place, we remark that the blacksmith anciently discharged the functions of a farrier, perhaps this will be thought not to cast much light upon the subject, but rather itself to need illumination. Remembering, however, that to the minds of our forefathers the offices of barber and surgeon seemed naturally to go together, we cannot be surprised that to the same minds it should appear part of the fitness of things that the blacksmith who shod a horse should also doctor it. And, now, as Mr. Spencer would say, observe the implication. In doctoring a horse it must sometimes have been necessary to extract a tooth, and it was at once inferred that he who could extract a horse's tooth, *a fortiori* could draw a man's. And that he did often draw, to admiration, both the tooth and the man, may be imagined. Figure the blacksmith with his patient careering round and round the forge, emulating the dealings of Achilles with Hector, and then listen to those who deride what they call the merely material civilization of the present day. Great is the transition from the blacksmith's shop to the modern dentist's ingenious arm-chair—we had almost written easy-chair. On the other hand, it may be that the need of dentists has much increased with civilization. It is commonly believed that savages have excellent teeth; and although we are nowadays in the habit of suspecting such beliefs, this one seems probable, if we consider how necessary good teeth are to them. To any one who is anxious to prove 'material civilization' a mistake, the inquiry may be suggested, What effect has the invention of knives and forks had upon the teeth of those nations that have condescended to adopt the use of them? For these pernicious utensils plainly render good teeth less a necessary of life than they were before, so that people with bad teeth now survive, transmit their degenerate natural weapons to their descendants, and so on. And, therefore, to Mr. Galton and others who are anxious to guard the interests of the future by promoting marriage on scientific principles, we may suggest the propriety of including sound teeth in the list of excellences required of those about to marry."—*Boston Journal of Chemistry.*

THE NEW DENTAL HOSPITAL.—The new building in Leicester Square was formally opened on Monday night, the event being celebrated by a *conversazione*, to which a number of distinguished visitors were invited by the Managing Committee. The ordinary monthly meeting of the Odontological Society took place at eight o'clock; and the President, Edwin Sercombe, Esq., delivered an inaugural address that was of unusual interest on account of the occasion on which it was given, and still more remarkable for the very great ability of which it gave evidence. During the course of the evening, six or seven hundred visitors inspected the rooms of the new building, and were shown by the office-bearers of the hospital and the Odontological Society the various arrangements that had been made for the accommodation of the staff of dental surgeons and students, as well as of the lecturers at the School of Dental Surgery. A number of objects of interest were exhibited in the principal rooms; and a very beautiful series of microscopical subjects, illustrating the development of the teeth, was shown in the library by Mr. Charles S. Tomes. Altogether the evening was a great success; and the visitors, both professional and non-professional, evinced the greatest interest in the proceedings. On the completion of this building, we feel that Mr. Edwin Saunders may be fairly congratulated, for to that gentleman's munificence and energy the success of the enterprise has been mainly due. At the same time, the entire dental profession have readily responded to the appeal made to them for help; so that an important and very valuable institution for the alleviation of pain among the suffering poor has been handed over to the trustees for the public, ready for immediate use, and entirely free of debt.—*British Medical Journal*.

HINTS AND QUERIES.

WILL some one have the kindness to explain the *philosophy* of the ossification of the dental pulp?—L. C.

WHERE ARE THE SECOND BICUSPIDS?—Miss N., aged twenty-nine, has both right and left deciduous molars. One has a slight cavity, the other I filled eleven years since, thinking it might not be replaced should she lose it. The bicuspidæ have not put in an appearance. The molars appear firm, and look like doing good service for many years.—A. H. S.

O. P. Q. is informed *very emphatically* that there is no institution in Philadelphia which confers the degree of D.D.S., whose diploma would be recognized and respected by the profession, except the Pennsylvania College of Dental Surgery and the Philadelphia Dental College.—EDITOR.

TO FREE APPROXIMAL SURFACES OF SURPLUS AMALGAM.—Pass a thread just beyond the filling or beneath the free margin of the gum as the case may be, then holding the thread, one end in either hand, draw it toward the cutting or grinding surface, and you get *struck measure*. A little experience with this method will enable you to get a good surface for the burnisher.—A. H. S.

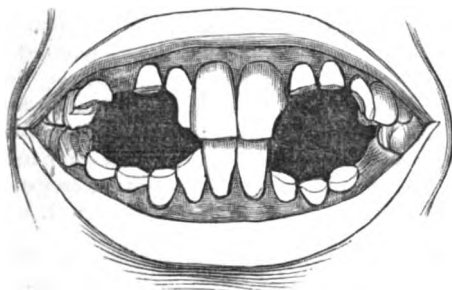
HOW TO CLEAN PALATINE SURFACE OF RUBBER PLATES.—Coat your model with tin-foil. I use S. S. White's No. 8, which is made to adhere firmly with shellac varnish.

When your plate is polished, wash it clean, then immerse in muriatic acid, pure, for say fifteen minutes, and see how easily the tin rolls off, also how bright the plate will be without further trouble.—A. H. S.

WEARING OF THE TEETH FROM THE USE OF A CLAY PIPE—I have recently been operating for a patient whose mouth furnished an illustration of mechanical abrasion from the use of clay pipes. The patient, a native of Germany, emigrated to Australia in 1858, being then about twenty-five years of age. He engaged at once in mining, and having been addicted to smoking, could not refrain from it even while at work. As no better medium for the combustion of the weed was to be had, he was compelled to the use of clay pipes. He continued working and smoking for twelve years, and then came to America.

He tells me that it was his custom while using the pick or shovel to support the pipe between the canines and first bicuspid, and when making heavy strokes the pipe would move a little. After a few years he could close his teeth and still have room for the pipe.

The accompanying diagram illustrates the effect upon the teeth. The left superior cuspid is worn down nearly to the gum, and looks as though it had been



filed for pivoting and then polished. The pulp-cavity is not exposed, but is covered with so thin a layer of dentine as to make the touch of an instrument painful. The other abrasions are all in the form of a segment of a circle, and are all highly polished. The second left lower and the first upper right bicuspid have been extracted. The teeth are all free from caries, but discolored badly.—DR. ERICH RICHTER, *Uta, Colorado*.

ALVEOLAR HEMORRHAGE.—I extracted recently the inferior left *dens sapientie*, for a gentleman about thirty-three years of age. The following afternoon he returned, looking very pale and weary, saying that the hemorrhage had continued from the time the tooth was extracted,—a period of twenty-four hours having elapsed. I prepared two pieces of lint, one larger than the other, dampened them with water, and rolled them in powdered kino. I cleaned out the socket, placed in it a little of the powdered kino, then the small piece of lint, then the larger one, and on these a piece of cork, which I directed the patient to press into the socket by slowly closing the mouth. In a few moments the hemorrhage had ceased, and did not return again. I believe powdered kino, if skillfully applied, will arrest almost every case of bleeding from a tooth-socket.—LUTHER CAMPBELL.

ICE IN ALVEOLAR HEMORRHAGE.—I extracted recently the two temporary inferior molars of the left side for a boy seven years of age. The teeth were badly decayed and the roots of the first partially absorbed. The extraction gave

no trouble, and was followed by only an ordinary amount of bleeding. The following afternoon I was sent for, because of a profuse bleeding from the socket, which had began early in the morning and continued all day. On examination, I found it proceeded from the socket of the second molar, and was arterial blood. Having cleaned out the socket, I applied tannin on lint, which checked it for a time, but during the evening it bled worse than ever. I then applied nitrate of silver on a small piece of lint, and plugged the cavity tightly with lint. The bleeding began again, however, in the night, and the family physician living close at hand, being called in, he removed the plug, washed the socket with a solution of sulphate of zinc, applied ice externally, and directed a piece of ice to be kept in the mouth on the affected side. In three hours the bleeding finally ceased.

I do not remember to have heard of excessive hemorrhage from the socket of a temporary tooth. I think the ice was the principal agent in checking the bleeding.—J. W. NORMAN.

DISLOCATION OF THE INFERIOR MAXILLARY.—A few weeks since Mr. A. applied to me for the extraction of the left inferior *dens sapientie*. After passing the lance around the tooth to break up the attachment of the alveolar processes, I applied the forceps, but instead of extracting the tooth, produced a complete dislocation of the jaw. I reduced the dislocation without difficulty, and proceeded to extract the tooth, but with the result of again dislocating the jaw. Having once more reduced it, and having allowed the patient to rest for awhile, made another attempt, and succeeded in extracting the tooth and dislocating the jaw at the same time. Having restored it to its proper position, I examined the tooth to see if any peculiarity existed which made it so difficult of extraction, but found only *very* long roots, though but slightly divergent. The patient told me he had never had any dislocation of the jaw before.—EDWARD H. BOWNE, D.D.S.

RUBBER DAM PUNCH.—I notice many articles in the various journals upon the how, and the how not, to punch holes in rubber dam, and in view of my own simple method of accomplishing the object, they are to me exceedingly amusing; pre-eminently so the article entitled "Rotten Rubber," in the last issue of the *Cosmos*. It is probably a well-known fact that the large end of an excavator *will* punch a hole in the dam, if pushed sufficiently hard to do so. Now, my method is this: Take an excavator, or anything similar, place the blade end against your chest and hold it there. Now take your rubber dam, and at the spot where you desire the hole, place it over the large end excavator, and with one hand grasping all the surplus rubber, stretch it *over* the excavator to its utmost limit,—*not* so far as will allow the excavator to push through it, but let up in your stretching just before it reaches this point of tearing through. Now, while it is in this position, at its utmost tension, take a sharp knife and tap the rubber at the *end* of the excavator *suddenly* and sharply. Your excavator passes through the hole just made, and you find you have an exceedingly small and *perfectly round* hole. If you wish a larger hole, tap it with your knife a little nearer your body, or the blade end of the excavator. Tap it still nearer your body, and you get a still larger hole, and so on; the nearer the blade you tap with your knife the larger the hole. Thus you dispense absolutely with manufactured punches, and can make *any sized* hole you desire, and at just such positions as you may wish, either far apart, or just as near together as you may have occasion for.

I wish to say to "G.," who calls upon me to "rise and explain" my methods of "harnessing steam," that I will soon take some method of satisfying his very proper curiosity.—J. FREDERICK BABCOCK, D.D.S., *Bangor, Maine*.

MALLETS.—I know no subject that has been so thoroughly exhausted as that of mallets. As, however, I have never helped in the process of exhaustion (except at my own chair), will you give place to my experience, though unimportant it may be? This word experience suggests a multitude of thoughts. After a hard day's work over your chair, with nervous patients, striving for perfection at the posterior surfaces of molars whose distance is perplexing, if not enchanting, it is consoling to reflect that others have passed through the same ordeal.

The reports of these every-day experiences and difficulties, and how surmounted, that come to us occasionally through your valuable journal, are, to me at least, very interesting.

But I am wandering from my subject, which, by the way, reminds me of a very valuable lesson taught me by one of my patients some time ago.

After progressing about an hour on a large filling, I was informed that a friend wished to see me in an adjoining room. I left my patient, with a feeling of gratitude to the inventor of rubber dam, which enables me to leave in the midst of an operation. My interview was interesting and prolonged; but when I returned to my patient, the expression of her eye told me that it was not so interesting to her; and, after completing the operation, she very emphatically told me so with her tongue. She had no objections to my having interviews with friends, but not at the expense of her comfort. To use her own words, which were not intended to be inelegant, "it was decidedly *rub-ber-ing* it in."

But now to the mallets. I have used every form of mallet that I ever heard of, from the small wooden to the six-ounce leaden, but have used almost exclusively of late a three-ounce block-tin encased in vulcanized rubber.

Having some experience in early life with the mallet used by carpenters, the idea impressed me, Why not use a wooden mallet of proportionate size for condensing gold? Accordingly I procured a block of hard, heavy wood, and reduced it to between three and four ounces, to which I put a handle at least one-half inch in diameter. It is a formidable-looking weapon, I assure you. The first opportunity I had of using it was on a patient for whom I had been operating for some time, and to whom the malleting process was exceedingly unpleasant. After using the block-tin mallet for some time on a very sensitive tooth, I quietly handed my *large* wooden one to my assistant. When the eye of my patient took in its immensity there was an involuntary shrinking, but after the first few strokes, the look of gratitude that she gave me fully repaid me for my trouble in making it. In other cases the results were similar.—M. S. KING, *Pittsburg, Pa.*

TREATMENT OF A CASE OF DEFORMITY.—In the month of October, 1878, Miss E. presented for treatment; her appearance and condition are described by Dr. Scott. I will simply give my method of treatment.

Took an impression in plaster, worked up a rubber plate, inserting six teeth, leaving the outer lower edge of the plate broad. Cut a groove horizontally in the plate, clasping the bicuspid and first molar teeth on either side, and running a spiral spring along the crowns of the teeth, one end fastened to the plate and the other to the clasp of the molar tooth. This spiral spring exerted a downward pressure on the plate.

Inserted a gold plate about one-eighth of an inch in width, passing around to each molar tooth. This gold band was fastened in the groove of the plate by rubber solder, and I was surprised to see its tenacity. As the soft parts receded, I used broader bands of gold. I append a description of the case by my friend, Dr. Scott.—G. M. ROOTES.

Some time in January I was requested by Dr. G. M. Rootes to assist him in the treatment of the case of Miss E., whose mouth had, in her girlhood, been injured by the imprudent administration of mercury. Her front teeth in the lower jaw were all gone, and the inner surface of the cheeks and lower lips adherent to the whole external surface of the inferior maxillary bone. The lower lip had turned inward. The mouth had the appearance as if one would draw the under lip in and close the mouth, with the upper teeth projecting. Dr. Rootes had been for some months previous to this time successfully combatting this difficulty by taking impressions of the jaw, making a set of false teeth, and ingeniously inserting into the lower edge of the set a piece of thin gold plate, which, by its constant pressure, caused a gradual recession of the soft parts from above downwards. Gaining a little in this way, taking a new impression, and adding a new plate, he had gradually developed a pretty good alveolar ridge. I am not much versed in dentistry, but I was disposed to give the doctor credit for the ingenuity and the success of this procedure.

Immediately in front, however, the adhesion was so firm as to defy the pressure of his plate. Here the lip, for the space of an inch or one and one-fourth inches horizontally, and about three-fourths of an inch vertically, was attached to the front surface of the maxillary bone by a firm, hard cicatrix, which contracted the whole lip and bound it down to the level, or a little below the level, of the upper surface of the jaw, greatly disfiguring the young lady, and making it impossible for her to articulate distinctly, as she could not approximate her lips. It was in reference to the severance of this adhesion that Dr. Rootes requested my opinion, as he had become satisfied that he could proceed no further without an operation. The adhesion was accordingly severed throughout its extent. Its texture was very firm, and offered considerable resistance to the knife. The hemorrhage was inconsiderable. The next difficulty was to prevent the union of these raw surfaces without interfering with their healing. This was successfully accomplished by the insertion of a gold plate into the under edge of her set of false teeth. It extended to the bottom of the cut, and separated the surfaces without seeming to produce any additional irritation. There was some inflammation, but much less than I anticipated.

In two weeks' time the surfaces were healed, the gold plate removed, a new set of teeth inserted, and the patient looked like a new woman. For a time after the operation the lip was hard and still somewhat contracted, but when all soreness was gone it rapidly improved, softening and yielding, so that when Miss E. left for her home in the country, she could cover her teeth with her lips and bring them very nearly if not quite together in talking.

This is some weeks since, and I am informed by her friends that she has greatly improved since that time.—E. T. SCOTT, *Fulton, Mo.*

PROFESSIONAL DIGNITY.—For professional dignity, California can grade it down to zero. I met one individual in North San Juan, Cal., who combines a stallion for breeding purposes with the dental profession, and travels about the country with him. Another, in Downieville, Cal., I have seen seated in a livery-stable finishing a vulcanite plate, and showing the "boys" what he "know'd" about dentistry.

In this town we have another who combines the fish business with dentistry, and whose office and hands smell of his other occupation. Another, in Comptonville, Cal., combines clock- and watch-mending. Such are some of the phases of the profession in California.—*Dentist, Santa Barbara, Cal.*

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ORIGINAL COMMUNICATIONS.
DENTAL PATHOLOGY AND THERAPEUTICS.

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[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
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(Continued from page 178.)

WITHOUT further enumeration of effects of medicines, and deferring remarks upon phosphorus and the mercurials as irrelevant in this connection, I would say that in my experience I have never seen any cases of decided tendency to the *development* of caries which seemed to me fairly attributable to the action of medicine. To medicines and to medication, both locally and constitutionally, we must attribute the power of aiding in the arrestation or retardation of this disease when declared; but unless *systemic degeneration* were deliberately or unintentionally produced, I do not believe that the *induction* of the disease is at all probable.

It seems to me that, when upon systemic causes of caries, I have sufficiently explained *why* it would be reasonable to expect much degeneracy of tooth-structure, and this evinced in the usual form of dental disease, after severe illness, and *consequent protracted medication*; but the almost universal belief of convalescent patients that this subsequent decay is due to medication warrants a fullness of expression which shall enable us not only us to relieve the general practitioner from what seemed to be an unfortunately necessary complicity in the production of an unpleasant condition, but shall fortify us in the position that just so far as general medication was instrumental in combating disease and aiding restoration to usual health and strength, so far it was *beneficial* rather than prejudicial to the teeth.

Food.—It has long been taught that much of the deterioration of tooth-tissues, and consequent predisposition to caries, is due to improper nourishment, and I feel that I cannot too strongly urge the truth of this doctrine; indeed, I must go further than reiterate the views which

are held in relation to the injury done breadstuffs by that excessive refining which is adopted to make them "superfine"; I must not be content with doing less than directing attention to the almost universally artificial character of the "most desirable" produce of our markets. Everything is so forced as to be rendered incapable of response to the demands made upon the daily food for various tissues which shall fully subserve their intended purposes; and yet so eagerly is sought the most tender meat of full-grown animals, the fattest and largest of young meat, such as veal, lamb, etc.; spring poultry of large size; early vegetables of all kinds, peas, beans, etc.; and, worst of all, potatoes; fruits of mammoth growth; seemingly regardless of any quality other than the possession of size, that it would seem upon reflection to be absurd to expect anything in dental tissue other than the softened structures which yield so readily to the localization of *caries*.

Special seasons seem to bring special troubles which are distinctly referable to food; and thus, when strawberries and peaches, for example, are abundant, we find constantly occurring cases of excessive sensitiveness and marked tendency to *caries*, all of which is readily and rapidly removed by abstinence, and possibly the administration of a few doses of some simple antacid, such as chalk, lime, or soda.

Sugar is an article which holds a very important place in this connection; it is a staple, and decidedly a luxury; it is used as the most ordinary adjunct of the daily repast, and as the large component of our most delicious and costly preserves, jellies, cakes, and confectionery, and it therefore behooves us to consider well its action in relation to dental *caries*. It seems insufficient, on the one hand, to ascribe the decay of the teeth of candy-makers and pastry-cooks, who are constantly tasting all sorts of fruits and condiments as well as sugar, to the sugar alone, whether it be taken in bulk or in small quantities (each method having received its suggestive reasons for producing decay); while, on the other hand, it seems equally illogical to ascribe the fine, *white*, (?) sound teeth of the negroes and Indians to the excessive quantity of sugar eaten by them.

That which we shall have to note, is the fact that among patients we find those that are fond of sweets, and gratify their taste by frequent indulgence, possessing good dentures and bad dentures, and we also find among those who scrupulously avoid any excess, or indeed reasonable indulgence in this direction, equally good and equally bad teeth.

In my practice are two patients who were the unfortunate possessors of exceedingly soft teeth, excessively tender and markedly predisposed to decay. One, a young lady, was rigidly denied all sorts of cake and candy, and never used sugar as it is ordinarily used, as she drank only water; the other, a young gentleman, had free access to one

of the largest manufactories of probably the best confections in the world. The teeth of each had been filled repeatedly with gold and tin by excellent operators, the operations usually failing in two or three years. For each patient some temporary and some permanent (according to location) fillings of red gutta-percha were introduced; and for the first, who strongly desired sweets, was prescribed a pound of mixed barley, clove, and sassafras candy each week, gradually diminishing the quantity as the desire for it became less, while the second was directed to use an antiseptic wash (phénol sodique and water) for brushing in the morning, and to apply to the lower teeth precipitated chalk in small quantity, without rinsing the mouth, at bedtime. Five years have elapsed since these directions were given; the first still gratifies her now reasonable desire for sweets, and the second still continues the daily practice of all these years; and each have several gold fillings of three years' duration about as good as when introduced; and each has several of the originally introduced gutta-percha fillings, that look as though but a day had elapsed since their insertion.

These are extreme cases, selected as such; but a like result in a large number of cases which have illustrated, in greater or less degree, the principle involved in these, has led me to the conclusion that sugar can neither be placed as injurious to tooth-tissue, nor can it be considered as likely to produce teeth of high quality; but, according to the character of existing conditions, may its use, even in large quantity, be eminently advantageous or its abuse equally detrimental; in other words, when cases have presented with developed tendency to caries, having as concomitants deprivation of sugar and evident desire for it, I have always obtained good results from its systematic administration.

Again: when cases have presented with developed tendency to caries, having as concomitants an evident derangement of function generally, with want of appetite, lessened digestive power, languor, etc., due to excessive indulgence in sweets, I have found just as much good to accrue from that degree of prohibition which serves to restrict the indulgence within reasonable bounds.

Parasitic.—In connection with this subdivision of general predisponents to dental caries, we have that exceeding interest which seems always to attach to microscopic research.

Here we leave theorizing and tell of what we can see; and yet even here we find the utmost antagonism of ideas existing among men whose learning and observation entitle their opinions to great respect.

It seems that the weight of testimony compels us to admit the existence of *leptothrix* almost if not absolutely at the inception of caries; its presence is manifest long before any boundaries have been outlined which indicate the establishment of decay; but it is not yet claimed that the presence of *leptothrix* in any given circumscribed position is

the only excitant of that softening of enamel and dentine which is the precursor of caries; much less is it claimed that the presence of *leptothrix* is antecedent to those structural changes in enamel and dentine which were first described by Mr. Tomes. It is, therefore, admitted that very early in the progress of the disease, in fact, just as soon as the degree of external decalcification of enamel will permit, we find this fungus feeding, as it does, upon tooth-structure, commencing the work of notably hastening the rapidity with which both enamel and dentine are finally disintegrated.

While, therefore, I cannot agree with the advocates of the theory that dental caries is a disease of parasitic origin, I would nevertheless desire that due importance should be conceded to the presence of the fungi, and that their great power for harm should be fully recognized.

Second. *Local Predisponents to Dental Caries*—1. *Structure*. It has long been noticed that it is advantageous to so view the varied structure of teeth as to make three or at most four divisions of them all.

1st. Teeth of firm, dense structure, yellowish in color, having exceedingly hard but not unduly polished enamel, and so little predisposed to caries as usually to remain sound throughout a long life.

2d. Teeth the structure of which is less dense, the enamel not so yellow, but more cream-color; not decidedly predisposed to decay, but in connection with which we find frequently circumscribed caries; not at all rapid in its progress, but, on the contrary, marked in this respect by moderation. To this class belong the teeth upon which the most satisfactory dental operations are performed. The limited amount of sensation pertaining to their dentine admits of almost painless excavating; the comparative density of general structure permits "thorough" preparation, in its ordinary acceptation; the walls of the cavities are smooth and strong, and a properly introduced filling lasts from twenty to thirty, and even forty or more years.

Operating upon teeth of this class is the pastime of the practitioners of dentistry.

3d. Long, pearly, cuspy teeth, beautiful in shape, possessed of translucent and highly polished enamel, of fair, and indeed more than fair, density, but whose dentine is too largely organic to be physically resistant.

It is in this class of teeth that we find all grades of sensibility, from more sensitive than permits of comfortable operating, to that exquisite sensibility which causes painful shrinking from the mere idea of instrumentation.

In this class we also find that decided predisposition to caries which, for want of more accurate knowledge, we attribute to peculiarity of structure. In all recognized localities for caries, teeth of this class are

liable to decay; and so far from the boundaries of the disease being circumscribed, they seem to be under but slight limiting control.

It is in these teeth that we meet most frequently with cavities of decay, which, having found location upon the buccal faces of molars and bicuspsids, soon extend quite below the margin of the gum, and which, having then with great difficulty been filled, sooner or later evidence their unfortunate capability for further progress.

Then it is that we have the decomposition of tooth-structure both mesially and distally along the necks of the teeth, until we find a more or less complete encircling cavity of decay.

I think the experienced of my profession will sustain me in the assertion that there are no operations in the line of filling which require greater patience and skill than the attempts to remedy such defects; and these are the more annoying, from the conviction ever present that even the best efforts are liable to fail in a comparatively short space of time.

And not alone in these peculiar positions does nature seem to triumph over art, but it has come to be an accepted thing that length of duration for fillings has to be spoken of cautiously in connection with most of this third class of teeth. Patients have to be educated in the knowledge that all dentures are not alike, that while some teeth will reflect credit upon the specialty of dentistry, *even though credit is not fairly deserved*, others will seemingly disparage the claims which our profession presents to entitle it to high rank in the scale of utility, even though the best efforts of wonderful skill are earnestly put forth. The decay of these teeth has received the distinguishing appellation of "horny."

4th. The teeth of this class seem properly to occupy this last and lowest position in classification, for they are as soft of structure as those of the first class are dense; they are as opaque and weak-looking as their opposites are clear and strong; they are subject to decay which presents, in every particular, decided indication of characteristics directly the reverse from the best kind of teeth. In short, they are about as worthless as those of Class I. are worthy.

The decay of this kind of teeth is very extended, very rapid, very completely disintegrating, and, usually leaving a white, soft, pulpy residuum, has become generally known as "white decay."

The walls of the cavities are thin and friable, preparation for filling is necessarily much less satisfactory than even in teeth of the third class, although in one particular it is decidedly more satisfactory to patients.

This is due to the almost universal absence of sensation, and the ease and comfort with which these soft and senseless teeth can be manipulated is their only recommendation.

Like dentures of the third class, these give no promise of satisfactory durability so far as either teeth or operations are concerned; but we

nevertheless deem it eminently proper that everything consistent with economy and relative worth should be done to combat the wasting away of these unfortunately constituted organs.

(To be continued.)

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 285.)

THE NOSE.

II.

THE EXTERNAL NOSE.

THIS has already been spoken of in the preceding chapter as a proboscis. The proboscis of an animal is a development from the parts found in the external nose of man, although we do not find all the parts present in the one produced in the other. Thus, the nasal bones are negative agents in shaping a proboscis; they are large in the hog, in which the proboscis is small, and small in the elephant, in which the proboscis is large.

The true way of studying the external nose is to view it as an appendage to the organ of smelling,—as the outer and middle ear are appendages to the organ of hearing. As a *vestibule* to the internal nose, we find each *nasal bone* of importance, holding fixed proportions to the size of the vestibule of its own side, to which it is the operculum or roof. The anterior orifice to the vestibule is the nostril, and is defined by the *cartilages of the nose*; we thus come naturally to the outline of our subject: (1) the nasal bone; (2) the cartilages and skin; (3) the interior of the vestibule.

(1) *The Nasal Bone*.—The nasal bone is situated upon the face, wedged in between its fellow of the opposite side, internally, the nasal process of the superior maxilla externally, and the nasal notch of the frontal bone superiorly. The length, breadth, and degree of inclination of the nasal bones determine the shape of the nose. The inferior margin is continuous with the upper lateral cartilage of the nose, and is marked in the middle by a notch for the transmission of the nasal branch of the ophthalmic nerve. The nasal bone is composed chiefly of compact tissue. It is thick and narrow above, thinner and widened below to form the upper boundary of the anterior aperture of the nasal chamber of its own side. Directly behind the median line is the vertical plate of the ethmoid bone and the nasal spine of the frontal bone. The nasal bones concur to form the bridge of the nose, and slant obliquely downward and forward. The anterior surface is concave from above downward, and

convex transversely, and marked by a minute foramen. The internal border is produced posteriorly. The two bones thus form a groove for

FIG. 31.—ANTERIOR VIEW OF THE LEFT NASAL BONE.



1, frontal border; 2, nasal border; 3, maxillary border; 4, lower border; 5, nasal foramen.

the reception of the vertical plate of the ethmoid bone. The outer border is serrate at the expense of the internal surface above and the external below.

The union of the nasal bones with the ascending processes of the superior maxillæ, the frontal, and ethmoid is one of immense strength, and enables the parts to preserve their continuity, except under extraordinary combinations of attack. It is impossible to fracture the nasal bones transversely, without injuring the frontal spine and nasal septum as well. It should be always remembered that emphysema may occur after fracture of the nasal bones,—a complication due to blowing the nose, thus forcing air through the ruptured mucous membrane. Emphysema from this cause may extend beneath the eyelid.

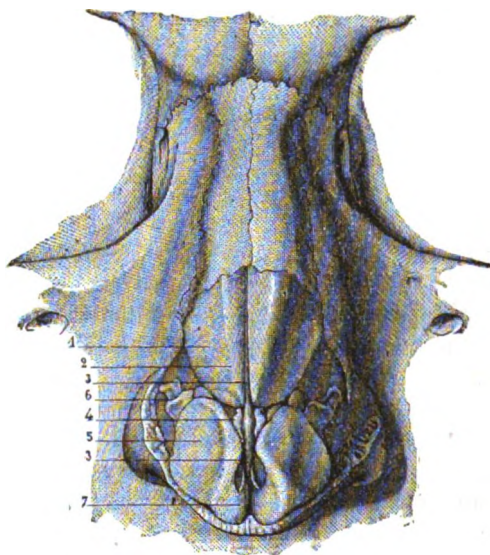
(2) *The Nasal Cartilages and Skin.*—The *cartilaginous portion* of the external nose is composed of two pairs of cartilages, the cartilage of the septum, and a few isolated sesamoids. The main cartilages are divided into the upper lateral and lower lateral.

Each *upper lateral cartilage* is triangular, and continuous with the cartilage of the septum as a wing-like expansion. The anterior margin is thicker than the posterior. The cartilage meets its fellow of the opposite side above, but is closely united to the septum below. It is inserted into the ascending nasal process of the maxilla and the nasal bone. The outer border in some measure projects towards the interior of the vestibule, and is seen in faint relief beneath the mucous surface.

The *lower lateral cartilage* enters into the outer and anterior circumference of the tip of the nose. It is distinct from the septum, but does not enter the wings; hence the term sometimes applied to it, the cartilage of the wing, is erroneous. Each cartilage is acutely flexed in the middle, with the outer surface of the angle lodged in the tip of the nose. A depression is felt and often seen at the interval between the tips of the two cartilages. The two arms formed by the flexure pass backward; one towards the septum, the other towards the wing,—thus

allowing the plane of the nostril to be shaped between. The inner arm is much the smaller, and lies under the border of the septum, in union

FIG. 32.—CARTILAGES OF THE NOSE.



1, upper lateral cartilage; 2, its anterior border; 3, anterior margin of the cartilage of the septum appearing between the lateral cartilages; 4, vomerine cartilage; 5, lower lateral cartilage, back of which is the wing of the nose; 6, accessory cartilages; 7, tip of the nose where the lower lateral cartilages are bent inwardly along the column.

with the corresponding arm of the opposite side. They do not reach the anterior nasal spine, but terminate abruptly in advance of it. Any one can satisfy himself of the close juxtaposition of the inner arms, as well as their independence of the septal cartilage and the anterior nasal spine, by manipulating the structure of the septum of the nostrils between the thumb and index-finger. The outer arm is broad and flat; at times somewhat arched, at others plane, according as the nose is broad or small at the tip. Huxley has called the rudimentary external ear of the crocodile the ear-lid. Let us call the lower lateral cartilage of man the nose-lid.

The sesamoid cartilages are three to four in number, although there may be more. They are flat, rounded nodules placed in the wings of the nose, though one conspicuous pair is placed on either side of the nasal septum. These are named the right and left vomerine cartilages.

The wings of the nose are composed of sesamoids, some fibrous tissue, and fat. The septal cartilage has already been mentioned as continuing the septum in advance of the vomer and the vertical plate of the ethmoid bone. Between it and the inner arms of the lower lateral cartilages is a membranous space which is continuous with the skin

between the nostrils. Hyrtl* informs us that a cancerous tumor has been removed from the floor of the nose by dividing the septum in the median line, but without opening either vestibule. According to Blumenbach (Hyrtl, *l. c.*), a strong process of the membranous septum is characteristic of Jewish heads.

It will be thus seen that the cartilages are the main support of the lower part of the organ. They give expression to the organ and to the entire face. High noses are likely to have thin cartilages with narrow nostrils; small flat noses, on the other hand, have large, rounded nostrils. The muscles moving the cartilages are rudimentary members of the group of facial muscles, and need not be here described. They are accessory to respiration, as can readily be seen in facial paralysis, or as was notably observed by Sir Charles Bell in sections of the facial nerve in the horse. The inability of the surgeon to reproduce cartilage in the tip of a restored nose, must always cause the operation of rhinoplasty to be an inartistic makeshift.

The Skin Surface of the External Nose.—This is thin on the bridge and the sides, where it is easily moved and wrinkled. Beneath the skin of these points a loose connective tissue is found, containing little or no fat. Toward the cartilages, the skin can be raised with difficulty, and toward the sides and tip not at all. We thus find two distinct regions of the nose mapped out. The thumb and index-finger can define them by lifting up a fold of skin over the bridge and between the eyes, beneath the line of the brow. The point at which a fold ceases to be defined as the fingers approach the tip of the nose, separates the tip or lobe of the nose from the remaining parts. Sebaceous glands are abundant in the tip, wings, and in the furrow (naso-labial groove) between the wings and the cheek. Hairs are occasionally seen growing from about these follicles.

The *form* of the external nose necessarily depends upon the proportions preserved between the skin-fold and the lobe, as above indicated.

There are a hundred pretty mouths and eyes, says Thomas Hardy, for one pretty nose. A pronounced bridge is common among the white race, while a depressed bridge is the rule among Asiatic people. The negro is remarkable for the depressed bridge, and enormous expanse of tip and wings. When the bridge is well seen, the nostrils are of course thrown downward, but in less evident expressions are more conspicuous from in front; so that in children with whom the bridge is undeveloped, and in the adult Asiatic, the nostrils are alike inclined forward and upward. The pug nose is often associated with a similar condition of the bridge. Such realistic Watteaus upon faces appropriate thereto are not without their own attraction. The Chinese mother

* Topog. Anat., i. 289.

entertains a yet nobler sentiment with respect to them: "When the tip of the nose turns up," says she, "it is a sign that you will go to heaven; but if it should chance to turn down, it is a sign that you will go straight to hell!"* So that it becomes important that we should look after the shapes of our noses.

(3) *The Interior of the Vestibule.*—The mucous lining really defines the vestibule, which may roughly be said to be the interior of the external nose. Beginning in advance of the line of the extremity of the middle turbinated scroll and the inferior turbinated bone, the mucous lining extends forward on either side of the septal cartilage and on the sides of the vestibule, lining the groove-like depression on the hinder side of the nasal bones, superior lateral cartilages, and the angle of the inferior lateral cartilage; thence, to form a pocket above and in front of the anterior margin of the nostril.

At the lower fourth of the septum, and at both inner and outer wall, the mucous tissue becomes more derm-like, and is then continuous with the outer skin.

Each vestibule has the shape of a flask, flattened on one side like a urinal, with the neck prolonged, compressed, and directed upward. The inner wall is formed below by the inner arm of the lower lateral cartilage,—a groove answering to the membranous septum, and above by the septal cartilage. The outer wall is formed by the outer arm of the lower lateral cartilage, and a depression behind it formed by fibro-adipose tissue of the wing. The roof is continuous with that of the nasal chamber. The floor is depressed a little below the level of that of the nasal chamber, so that such an instrument as a Eustachian catheter is best introduced by first elevating the tip of the nose. The superior orifice of the vestibule is a mere chink, and in consequence affords little or no aid in the introduction of instruments into the nasal chamber for the removal of morbid growths. The inferior orifice (the nostril) is an ellipse, whose internal border is nearly straight, and whose external border describes a curve with the posterior extremity, as a rule, more rounded than the anterior.

Both outer and inner aspects of the vestibule near the nostril, as well as the pocket at the tip, are furnished with stiff hairs in patches.

Looking in the nostril by aid of a strong light when the head is thrown back, one sees the following points: 1st, a darkish chink, far within which is the posterior orifice of the vestibule; 2d, on the outer side, the ridge formed by the inferior border of the upper lateral cartilage; 3d, on the same side, a ridge formed by the outer limb of the lower lateral cartilage.

* Travels in the Central Parts of Indo-China, Cambodia and Laos. By Henri Mouhot, ii. 199.

At a point answering to the posterior border of the outer arm of the lower lateral cartilage we have a voluntary contraction possible by the tilting of this border inward towards the septum, at the same time that the wing of the nose is depressed and abducted. This action, incomplete in man, is pronounced in many quadrupeds, in which we may presume occlusion of the vestibules may be announced by the powerful adduction of the cartilages of the wing directly to the septal cartilage.

The Blood-vessels.—The arteries are placed for the most part between the skin and the muscles. Most of the branches are derived from the facial, although the internal maxillary give some branches through the infra-orbital, while some, to the bridge, are derived from the ophthalmic. The veins lie nearer the skin than the arteries, hence they are more conspicuous in hyperæmia of the organ. The veins are emptied for the most part either in the tributaries to the superior labial vein, and thence into the facial, or else into the network within the nose, which may communicate with the internal maxillary vein or the ophthalmic. The latter is a feature of great significance, as insisted upon by German writers, who have directed attention to the remarkable appearance of the nose resulting from cerebral engorgement, as in acute mania. Every one is familiar with the reddened nose of the toper, and every physician is aware of the value of this symptom in relation to endangered conditions of the cerebral circulation.

The *nerves* consist of motor twigs to the muscles and sensitive branches from the fifth pair. The *naso-ciliaris* of the anterior ethmoidal passes between the septal cartilage and the inferior border of the nasal bone, and goes to the skin of the tip of the nose. Branches from the infra-trochlear nerve supply the most of the nose, those from the infra-orbital the sides and the wings; a large branch therefrom pierces the *depressor nasi muscle* to supply the membranous part of the septum, and is lost in the skin-covering of the tip.

Owing to the free blood-supply to the nose, wounds of the organ readily heal. Instances are on record where the entire nose has been cut off from the face, yet upon accurate adjustment the severed organ has become reunited. Larrey* gives two cases of soldiers who had their noses divided from the root to the base by the sabre, so that they were attached only by the septum and a small portion of the alæ. Seven interrupted sutures, with a supporting bandage, were sufficient to produce union. A cicatrix in each case resulted, which was so inconspicuous that no deformity ensued.

Errors or excess of nutrition affect the nose very conspicuously, as in lipoma, in which disease enormous masses of fibrous and follicular tissue may form about the lower part of the organ.

* Memoirs, ii. 280.

Inflammation.—We have repeatedly observed periostitis and ostitis of the nasal bones from syphilis; but always dependent upon deep-seated nasal disease. Entire loss of the organ may occur in the course of erosive ulcerations, as in the last-mentioned disease, as well as in lupus and epithelioma.

Hemorrhage.—It is well to remember that hemorrhage very often is restricted to points within the vestibule. In the event of its being so located, direct treatment by carrying a probe, armed with a pledget of cotton, carrying a styptic *upward* through the nostril, may promptly check a bleeding for which other means have failed.*

John R. Begg† has narrated a case of that extremely rare disease, idiopathic gangrene of the external nose and ears. A somewhat similar condition has recently been observed at the Philadelphia Hospital, by Dr. H. C. Wood.

(To be continued.)

FAICIAL DEFORMITY AND TREATMENT.

BY NORMAN W. KINGSLEY, D.D.S.

IN March, 1867, there came to me a gentleman about thirty years of age, with a deformity of the right side of the face, involving a depression of the right superior maxilla and atrophy of the superincumbent tissues. This deformity did not involve the malar bone nor the inferior maxilla, and was confined to the right side of the face, consequently the want of symmetry between the two sides of the face was quite marked. The depression of the maxilla was not the result of an accident, but was developmental and possibly congenital. That the external deformity was not wholly due to the condition of atrophy, was proven on taking a cast of the mouth, when the want of symmetry in the two sides was clearly shown. My attention was more particularly directed to this depression of the bone, because the patient himself claimed that the deformity had been caused by the extraction of the first molar tooth a few years before; but that this was an error was conclusively shown by the remaining teeth being in good condition, with but slight absorption of alveolar process where the tooth had been extracted, and by the general sinking as above stated.

Fig. 1 shows the external appearance; the left side of the face being fair in outline and of moderate plumpness.

The patient's desire was a restoration of contour by prosthetic treatment; and the accomplishment of this involved the conception of an appliance and a mode of procedure very different from the insertion of

* Dr. R. G. Curtin, in Phil. Medical Times.

† Lancet, September, 1870, 897.

an ordinary plumper adjusted to artificial teeth, and made to take the place of wasted alveolar processes.

It required the displacement of the muscles nearly up to the orbit of the eye, and the forming of a cavity in the soft tissues into which the appliance could be introduced. This was done by making gradual encroachments upon those tissues during a period of several weeks until the desired result was obtained.

The restoration was due partly to the displacement, as stated, and partly to the forcing upward of the tissue, thus thickening the cheek and adding to its fulness.

FIG. 1.



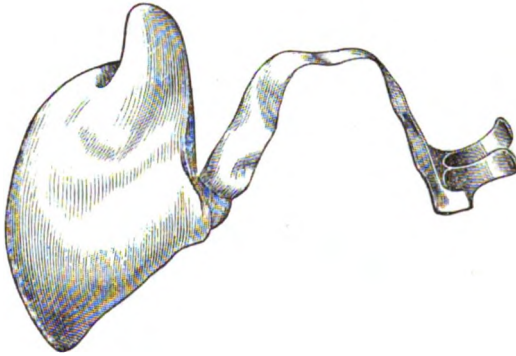
The prosthesis is shown in Fig. 2. It consisted of a gold plate three-eighths of an inch wide, attached to molar teeth on the left side of the mouth, reaching directly across the palatine arch and passing through the space formed by the extraction of the molar; its continuation from this point was formed of vulcanite, the body of which occupied the canine fossa and extended back to the tuberosity of the jaw, and reaching upward to the malar bone. At its anterior part a projection ran up to probably within a sixteenth of an inch of the infra-orbital foramen, and from the inferior surface a wing descended as low as would be permitted on the closure of the lower jaw.

Fig. 3 shows the external effect after restoration.

This result was produced, as stated before, not by a single effort, but

by the introduction of the gold plate upon which was built up the plumper of gutta-percha, adding to its fulness, from time to time, with gutta-percha or wax, as it could be borne. While the gutta-percha

FIG. 2.



was in a semi-plastic state, the jaws were exercised so that the form would be somewhat accommodated to the action of the muscles. In this

FIG. 3.



manner, such shape as was required for restoration of contour and which could be tolerated was determined upon, and then the instrument was duplicated in vulcanite.

This was worn with entire ease and comfort for two years and a half, and required only very slight alterations, save in one particular.

From the great size of the body of the plumper (its horizontal diameter being three-quarters of an inch), it was desirable to save weight as much as possible, and it was made open between the wing and the part lying next the gum; the result was a most disagreeable tone to the voice,—a hollow, cavernous sound, as of the voice lost in the space created by holding off the cheek from contact with the gums.

The remedy followed immediately on filling up this space. At the end of two years and a half the instrument was broken by accident, and, on duplicating it, some improvements were attempted, which consisted mainly in using soft rubber for the upper process and for the lower wing.

Experience proved that these were valuable improvements, for in the first instrument the rigidity of form, due to the unyielding vulcanite, would sometimes produce a rigidity of the muscles, noticeable particularly when there was much action, as in laughter. By the substitution of elastic rubber for these portions, that disagreeable effect was remedied. The soft rubber was not attached directly to the gold plate, but the body of the plumper was made of hard vulcanite, as in the first instrument, and the elastic compound attached to that.

The noticeable features of this case are—

1st. That the atrophied condition was confined entirely to one side of the face.

2d. That muscular tissue can be displaced to a very considerable extent without impairing its freedom of action.

3d. That the cheek cannot be lifted out so as to leave a space between it and the gum without changing the tone of the voice, and, incidentally, articulation.

OPERATIVE DENTISTRY.

BY DR. C. E. FRANCIS, NEW YORK.

(Report read before the Alumni Association of the Pennsylvania College of Dental Surgery.)

THERE is no department of our specialty so freighted with interest to the dental practitioner, as that upon which I am now called to report. It is the chief element of our daily thoughts, and the substance of our labors. In our social meetings it is the principal feature of our conversations; and in our society gatherings the absorbing theme of our discussions. Everything new concerning it that is offered or suggested meets our earnest attention; every actual advance is hailed with enthusiasm. Science and art are called upon to contribute their aid; and

efforts to real progress in perfecting dental operations are constant and untiring.

To review a field so wide in extent, with its countless avenues which genius and experience have so searchingly explored, is an undertaking not contemplated by this committee. It will simply refer to some of the more recent or prominent improvements that good fortune has cast in our favor.

In looking back to even some half-score of years, and comparing the present with the past, we have good reason to congratulate our profession on the perceptible advances it has made. Every step forward is a gain to humanity, for the nearer we approach the goal of perfection in our strife for true excellence, the greater will mankind be blessed by the results of our efforts. It is, however, a matter of serious regret that all who claim the name of dentist cannot be included when reference is made concerning professional progress.

In this country alone, some fourteen thousand persons are engaged in the practice of dentistry: men of every grade in the scale of professional ability; but how many of this vast multitude are fully qualified for the duties they assume? With abundant means for improvement at command, with splendid facilities within the reach of even the most benighted, a large number of this vast army, unwilling to be instructed, indifferent to the real requirements of their calling, are still plodding through the dark mazes of ignorance and incompetency. They care not for gatherings like this before me; they know not the advantages of an educational training. Colleges and societies are beyond the pale of their ideality; scientific books and periodicals find no welcome within their doors. For the benefit of future generations, it is to be earnestly hoped that the day is not far distant when every person who intends to practice dentistry shall, by legislative enactment, be required to possess a degree, denoting qualification, from some reputable dental college; then, to a certain extent, will the profession ultimately be purified, and bungling empiricism become a dream of the past.

In comparing the facilities enjoyed by the dentist of the present day with those of days gone by, what great changes are observed! The old, cumbersome, unwieldy operating-chairs are replaced by chairs of the most beautiful design,—compact, ingeniously constructed, and suited to all conditions desired. Instead of the unsightly spittoons, are marble basins, with fountains of clear flowing water. Swinging brackets are conveniently before us, bearing neat little tables, to which are attached burners of gas or alcohol for annealing foil. Cabinets for instruments artistically designed; operating-stools offering many moments of rest to weary limbs. Not the least among modern gifts are the famous burring engines, wonderful pieces of mechanism which render great.

service by assisting in preparing cavities and finishing fillings. Once accustomed to their use, they become almost indispensable. Your committee cannot yet express an opinion as to the comparative value of the various engines. The most popular, however, are the "Morrison," the "Elliott," the "electric," and "pneumatic." For consolidating gold fillings, mallet-force is still much employed, and with increasing favor: mallets of lead, steel, and wood; besides the various automatic mallets. Lead mallets give great satisfaction to those who have fairly tested them, and electric mallets are much approved by some operators. In filling teeth, several important steps are to be considered. Among the first, the preparation of cavities. Many failures in our operations result from lack of thoroughness in this respect. The cervical walls of the approximal and buccal cavities are often imperfectly prepared for receiving fillings, and suffer renewed attacks from caries. A fearfully large number of fillings thus located are undermined and give out. The difficulty generally results from inability to clearly see and define the exact condition of the cavities, moisture and cuttings forming interposing obstacles that conceal much of the territory we are excavating. In cases where blood or moisture intrudes, the rubber dam should be applied. Then with the aid of a mouth-mirror, and the heated air blowpipe for forcing out the cuttings, a clear view is afforded, and the work more quickly and thoroughly done, with actually less pain to the patient. On grinding surfaces of molars and bicuspsids, the imperfectly formed sulci or seams diverging from the surface of cavities are frequently left untouched when preparing them for filling. As a consequence, decay is again invited, having such easy points of ingress.

For permanent stoppings, gold foil is still the favored material; and in the large majority of cases it unquestionably forms the most reliable filling. Non-cohesive foil is, at present, very extensively used. It offers slight resistance to pressure, and becomes readily adapted to the cavity-walls. For large or deep cavities its employment is especially desirable. It is usually introduced in the form of cylinders or mats. After walls are thus protected, cohesive foil answers admirably for completing the fillings. It may be well here to add that it is not a waste of time or labor to give all our fillings a perfect finish. In this day of machinery it is easily done.

Tin foil, if well impacted, makes an excellent stopping. For third molars or for teeth of low-toned organism, it preserves the walls even better than gold.

Amalgams are probably used now as much as ever. "Improved" specimens are always in market. Your committee can say little in regard to them, but believe that they yet require much improving.

The operation of capping pulps is gradually meeting with increased favor. When of recent exposure and in a condition of health, a proper

treatment will usually insure their vitality. A slight touch of carbolic acid applied, then a nicely-adjusted cap of note paper dipped in a solution of bals. fir and chloroform, will afford good protection to the pulp. Gold-beaters' skin and white court-plaster are also used for this purpose. The caps are carefully covered with a paste of oxychloride of zinc, and in due season the cavities are to be filled with a more durable substance.

A word for children. Their claims cannot be ignored. Our best efforts should be directed to them. They need early care and much advice. They should understand the true value of their teeth, and how *necessary* they are to their health, comfort, and personal appearance. If children are kindly treated, and their confidence gained, much can be done for their benefit. Habits of cleanliness, if early taught them, will prove lasting.

It seems almost needless when before an audience like this, to even hint at the great value of the rubber dam. It is, of course, indispensable to all who know its value. In filling teeth with any material, it should be the rule, not the exception, to apply it. The more we become accustomed to its use, the more we fear to do without it. If any one present is ignorant of its merit, let him at once fairly test it. If any so perverse that he *will not* learn its value, we say 'tis a pity—a free gift of incalculable worth willfully rejected. In holding the rubber in its position, clamps are of great assistance. Varieties of these ingeniously devised appliances may be found at the dental depots.

Your committee cannot close this imperfect and hastily-written report, without referring to a specimen of operative dentistry recently executed by Dr. Marshall H. Webb, of Lancaster,—a case of pivoting and filling combined. We consider it one of the finest dental operations on record, and advise those present who have not seen this case, to avail themselves of the first opportunity to do so.

Honor to whom honor is due.

A NOT "UNEXPECTED PROPERTY OF ADHESIVE GOLD."

BY W. E. DRISCOLL, BEDFORD, IND.

IN the Periscope of the DENTAL COSMOS for April, 1874, pages 210 to 212, are two short articles from Thomas Fletcher, F.C.S., on "An Unexpected Property of Adhesive Gold." I have so often been entertained by the peculiar conclusions of this writer, that I eagerly await all his productions to see "what next."

This time, among other things, he says, "Choose a strong tooth, with an easy cavity to fill, fix it firmly in a vice, and with every possible care fill it with an adhesive-gold plug. Let no pains or time be spared; and when perfectly finished and satisfactory, drop the tooth

with its plug into a bottle of clear fluid ink. Allow it to remain for three or four days, take it out, dry carefully, and split it open. The ink will be found to have penetrated completely round the under side of the plug. Try the same experiment with soft gold foil or tin, and if the plug is made with proper care, the cavity will be perfectly white inside, without a trace of penetration."

I was almost ashamed to make the experiment, knowing, as well as I know anything, that the idea of ink or any similar fluid penetrating the edges of the cavity, as he affirmed, if properly filled, was absurd. But I did it; only I left the tooth in the ink twice as long as he said was sufficient. I inclose the tooth with this manuscript. It is split through a plug in each proximal surface; one of tin, the other of semi-cohesive gold; heated red hot before introduction. Although the cementum is deeply stained, if the editor detects any stain around either of the plugs which are still firm in one side of each of the cavities, he will please so state to the readers of the *Cosmos*.

It seems much like fighting a man of straw to refute such assertions as this writer makes, yet, when they find a place in a journal like the *Cosmos*, they do mischief if not promptly exposed. Of course, some old and young fogies will be elated to have an F.C.S., whatever that is, to champion their cause, even if done in statements as reckless as the following, taken from the article under consideration :

"That the majority of plugs inserted by the best operators, under ordinary circumstances, are not perfectly moisture-proof, and that an adhesive-gold plug never is so under any possible circumstances."

Well then, if cohesive gold won't do "under any possible circumstances,"—and all concede, I believe, that some cavities cannot be filled with non-cohesive gold or tin—then, amalgam or some other cement must be resorted to. In view of the experience of many with the materials of this class, this would be considered as rather a sad revelation. But he does not intend to leave us groping in the dark and gloom that would otherwise settle upon us.

Hear him : "If the testing, as to whether plugs are moisture-proof or not, is carried on with different filling-materials in the same way, it will be found a matter of the most extreme difficulty to get a plug moisture-tight, except in the most simple cavities; and where a cavity has two open sides, it is simply a total impossibility, except with the use of an amalgam, which has a distinct expansion whilst setting sufficient to make up for the imperfections in condensing without risk to the tooth. Believing this property of an amalgam to be an absolute necessity, I have been for a long time searching after a compound which has it, and is at the same time fairly free from discoloration, and have at last succeeded in finding one."

What a wonderful coincidence, that just as cohesive gold is found to

be a delusion, and unreliable "under any possible circumstances," that this great succedaneum is found, without a moment's loss of time, to take its place !

Feeling the utter poverty of language to do justice to the occasion, I will only add the query, Who will now lament that dentistry has not advanced within the last year ?

PROCEEDINGS OF DENTAL SOCIETIES.

JOINT SESSION OF THE MISSISSIPPI VALLEY AND MISSOURI STATE DENTAL SOCIETIES.

(Continued from page 264.)

FIRST DAY—*Evening Session.*

THE subject stated thus, "What are the Best Materials for filling Roots of Teeth?" was taken up.

Dr. Dean. Gold is the best substance for filling root-canals; but perhaps not always the most judicious, considering the time and expense attending its use. There are other substances less tedious and quite as good. For front teeth he prefers heavy numbers; winds No. 20 on a plugger, with which the foil can be carried just where it is wanted; another portion is added in the same manner, and the operation can be accomplished with great rapidity. Has no objection to wood saturated with carbolic acid, unless it be the danger of passing it through the foramen. The carbolic acid would last a long time, but might perhaps be absorbed in time. Cotton and creasote are not so objectionable as they once were in his view. Os-artificiel, etc., are good in certain places; but prefers gold as a rule.

Dr. Morrison referred to the use of wire of fine gold, as explained in a recent article in the *Missouri Journal*; this he considers better than a broach and foil, as there is no certainty whether the gold is carried up to or through the foramen. Fills the point of the root with wire, and the balance with oxychloride.

Dr. Cushing indorses gold in canals which are easy of access. Prefers shreds of cotton or silk with dissolved gutta-percha to oxychloride, in small and tortuous canals.

Dr. McCoy uses a preparation of gutta-percha similar to Hill's stopping, cut off in cone shapes, of the size of the cavity; wipes out with creasote, warms the cone, and with a cold instrument it can be forced up as hard as needed; if necessary, the instrument may be warmed; and the canal is thus perfectly filled. Also uses cotton saturated with a varnish made by dissolving rosin in alcohol, which becomes very hard.

Dr. Rehwinkel. We leave out of the question the condition of the tooth; this must be favorable to secure success. Hickory, orange-wood, gold, gutta-percha, etc., may be successfully used; but success which has not had the test of time is not entitled to be put on record. Gold may be the best thing for one case, and the worst for another. There is great diversity as to the time required before filling roots; some extirpate the pulp and fill immediately; others must wait a considerable time, and both claim success. To be safe, all methods must be compared under all circumstances. In some cases the pulp cannot be entirely removed, and in such a case there will probably be trouble, no matter what is used. If filled at once, oxychloride would probably be best, because it mummifies the pulp. Teeth devitalized by capping of the pulp with this material are very deceptive: they do not discolor, and appear often to be alive when they are dead. He usually waits three days after devitalization, and with barbed broaches removes the pulp after sloughing. When the opening is direct and the reamer can be used, the root may be filled at once. Stops with cotton for a few days, and when this is withdrawn it comes away charged with all the débris, and the cavity is thus cleansed. Leaves until the cotton is perfectly clean, and after that it makes no difference what the canal is filled with. Gold, to be sure, is the thing,—it's nice, it's genteel! In what form it is used is a matter of taste. The preparation of the tooth is the thing.

Dr. Harlan presumes that the teeth are in proper condition before they are filled. He fills the ten anterior teeth with gold. In molars uses oxychloride with floss-silk. Has a record of 312 molars; and of that number, after two or more years, all but three were free from abscess.

Dr. Crouse does not think wire will properly fill flat or irregular roots. Heavy gold cannot be adapted to the walls as well as No. 3. The objection to tin foil is, that it tears easily. Lead would be better. Thinks, in the use of a solution of gutta-percha, that the evaporation of the solvent will cause shrinkage. Would prefer heating. There is nothing better than No. 3 foil on a broach. Wire would be more easily driven through the foramen. Would as soon have wood as gutta-percha. Pivots on which teeth have been set for many years are found to be sound; but these canals are easy of access. Roots of lower molars cannot be filled with gutta-percha.

Dr. Goodrich doubts whether one in a thousand roots is perfectly filled, or whether it is necessary to fill at all. Has seen pivot teeth last for twenty-five years or more; and has seen gold punched one-sixteenth of an inch through the foramen. Thinks empty canals will not fill up with fluids.

Dr. Black prefers gold in all cases where he can use it, and that is

nearly all. Feels generally sure in front teeth that the root is perfectly filled. Occasionally resorts to other substances in lower molars and flat bicuspid. The substance should be imperishable. Cotton is apt to become tainted. Uses gold in the shape of small darts of soft gold and low numbers, conical, and tolerably hard. Lodges the first piece at the constriction at the apex. If the pulp is perfectly removed, fills at once. Had used wire, but had not found it satisfactory. If the root is round it may be successful, but not otherwise.

Dr. Morgan. This branch of operating has made no progress for fifty years. In 1842 there were articles published in the *American Journal*, which stated that roots had been filled with gold by Solymán Brown and Hudson for thirty years before that time. Gold is the best and most reliable article. Tin lacks tenacity, and is not so easily handled. With cements you cannot determine whether you have reached all the points. Had used wood saturated in creasote, but it is perishable. Has little confidence in the result unless the canal be enlarged. Rolls gold on an instrument with a sharp point, quite hard, and presses up and condenses. Fills the balance with strips of foil. The root must be sealed, to exclude the secretions. We may be deceived; air may be included. Except in instruments, this process had made no progress. There were a few men in Tennessee who filled roots forty years ago. Had removed a tooth, the root of which had been filled for thirty-six years; but had also found canals loosely filled which had remained twenty-five years. In reply to a question, said that when he could not fill roots perfectly with gold, he did as he used to do in reference to the rule to keep cavities dry, before the days of rubber dam,—he violated the rule, and did the best he could.

Dr. McKellops adopts what he considers the best plan. Dr. Clark filled roots with foil on a broach twenty years ago; that is his own practice still. He wants to feel that he will benefit his patient, and do himself credit. Has extracted teeth with all sorts of root fillings, and they were generally failures. Thinks it will take from one to two weeks to get teeth in proper condition; finds the apex usually so constricted that a fine broach will not pass. Changes cotton every day. Has had good results for twenty years.

Dr. Keely spoke of a lateral incisor ulcerated at eight years of age; entered from palatine surface. The root appeared to be much decayed or absorbed, and the soft tissues had been forced into it. He treated until the sensibility was reduced, and then filled with gutta-percha. This was twelve years ago, and there had been no trouble.

Dr. Black said the amount of shrinkage in using a solution of gutta-percha would be one-half; therefore roots so filled must be only half full.

Dr. Hunt has filled with all materials except rosin. Fills the point with gold, and then it makes no difference what is used for the rest of the cavity

Dr. Richardson questions whether many root fillings reach the apex in any but simple cases. If not, the filling is worthless. A large proportion of teeth may be saved with no root fillings; this is inferred from the number of imperfect fillings. It is no matter how it is done so that the root is rendered impervious. Uses gold first, then a small pledget of cotton saturated in carbolic acid. Likes Guillois's cement. A plastic material will fill the canals more perfectly. Roots, when small, will give no trouble.

Dr. Honsinger thinks that not one root in fifty is properly filled with gold. In the six anterior teeth uses gold, with cotton and creasote at apex. In back teeth, uses oxychloride; also, in cases where he is not sure that the pulp is perfectly removed; fills these with floss-silk and German cement, and has more success than with gold.

Dr. Hunter. We find that success is claimed with all sorts of material. Had seen a case of eighteen years' standing in which the gold protruded one-sixteenth of an inch. If cotton is a good material for the apex, why is it not for all the root? It is easily removed in case of necessity. Has filled with cotton and creasote for six or seven years, and has had success.

Prof. Taft. We have learned that a great many things can be used successfully; also that *nothing* can be used with success. What is best depends on whether the teeth are dense, or those of young persons. All foreign or decomposable substances must be removed; discharge must be arrested, and a cicatrix formed, and then, in adult teeth, no matter how they are filled. In young patients the soft solids will produce difficulty even where cases are most favorably treated. Spoke of pepsin to decompose remaining material. Following any one rule is empirical practice.

Adjourned.

SECOND DAY—*Morning Session.*

The morning of this day was devoted to clinics at the infirmary of the Missouri Dental College. They were performed amid the usual accompaniments of an eager and inquiring crowd of spectators; an insufficient supply of instruments and appliances such as the operators would have had at their command in their own offices; and the characteristic want of fondness for being hurt, even for the benefit of science, which is a well-known trait of members of the profession. If the spectators did not learn anything, the victims undoubtedly *did* learn that for a steady thing it was preferable to stand behind the chair rather than sit in it, disagreeable as the former occupation is in many respects. The operators, however, acquitted themselves with credit,—though it was not apparent that anything new or startling was developed or exhibited, either in modes of practice or in instruments and appliances.

Afternoon Session.

The high-toned and suggestive subject announced on the programme as "Hasty Operations; or, Trotting Them Through,"—a title which it might perhaps be deemed hypercriticism to say smacked more of the race-course than of the proceedings of a professional body, was taken up. It was expected that a paper would have been presented, but the gentleman who had charge of the subject apologized for not being prepared, and the meeting was therefore left to grapple orally with the ideas which the printed subject would no doubt start by the thousand in the brains of those present.

Dr. Keely acknowledged his stupidity in being obliged to consume some two hours in filling a cavity for a patient who had had twelve of them filled in half an hour by a man "who was so smart that he had learned his trade in six weeks, and made his own instruments, and warranted his work!" Of course, they came out in two weeks, and as the "smart man" who put them in had "moved on," he was not to be found to fulfill the conditions of his "warrantee." He instanced also another case of a party who had a D.D.S. at the end of his name, who filled five teeth in three-quarters of an hour, charging therefor the moderate fee of four dollars per filling. In three weeks they were "out," and required re-filling, which was kindly done without charge; but in six months they were again *hors de combat*, and the "warrant" having probably partially expired, the operator refilled them at reduced prices, viz., three dollars per cavity. He (the speaker) had used up two and a half hours on one cavity at his best efforts. He would say that in this case the graduate obtained his diploma by false pretenses; but he did not hold the authorities of the college excusable on this account. It was their duty to have investigated the matter.

Dr. Crouse suggested as a remedy for the tendency to slight operations, that it should be a rule among all operators to charge by the hour for their services. The present system of charging involves a constant temptation to make too many cavities. Some cavities he could fill three of in an hour,—and for others fifty dollars would not be too large a charge for the same number of cavities. Honesty and skill would go a great ways in correcting this abuse. By using soft gold we could save half the time; and if by its use we fill as well in one hour as in two by the other method, we should do so.

A lengthy paper on contour fillings, by H. L. Sage, illustrated by drawings upon the blackboard, was then read by Prof. Eames. From these drawings, and the letter-press of the attenuated paper (for it would have been too appalling in size to have been ventured upon had it been submitted without being reduced to print), it appeared that filling anterior teeth on the labial surface from the gum two-thirds the dis-

tance to the cutting edge was "contour filling" in the estimation of the writer. The principal interest exhibited in the paper, apparently, took the form of an inquiry, several times repeated, as to when the end would be reached. The end was reached at last, and the subject, if not the audience, was so completely exhausted that not a word was said in support or rebuttal of the positions of the essayist.

Dr. James Leslie, of Cincinnati, read a paper upon the subject of gold,—its preparation and methods of manipulation. It is not too much to say that while all the ideas as to manipulation assumed by the essayist did not meet with unqualified indorsement, yet the paper, as evincing thorough familiarity with the subject, and abounding with interesting information and useful ideas happily expressed, elicited universal applause, and was generally characterized as the most able paper read during the session. At the close of the reading Dr. Leslie responded to various questions propounded by his auditors, and the questions and replies showed that he was fully able to answer all inquiries about the precious metal, and that his readiness to do so was appreciated by those present.

Evening Session.

"Causes that Underlie the Decay and Loss of the Teeth," was the subject announced,—several intermediate subjects upon the programme having been passed over with no response when they were called.

Dr. Black said that the causes of decay were little understood. We *should* understand them, as they lie at the basis of our labors. In regard to the cause of different colors of decay, Prof. Watt says they are produced by different acids. He had performed some experiments, of which he gave an account, and had found that the color of hydrochloric acid in which a tooth had been dissolved had been changed from white to yellow by means of sulphuretted hydrogen. In neutralizing this acid solution he had produced every color found in dental decay. He had no doubt that this effect was produced in teeth in the mouth in the same way. By allowing the solution to remain some months he had produced the black decay which is characterized by Wedl and others as marking the cessation of active caries. This condition is always accompanied by alkaline saliva. The color he considers is due to the sulphurets formed in the mouth; they are insoluble, and find their way into the tubuli of the dentine. Decay occurs only at points where the fluids are stationary, or are in a ropy condition. The character of the secretions is constantly changing; they are alkaline in the night. The dentine is more vigorously attacked than enamel because it is more loosely put together; a porous or rough surface is always most liable to oxidation, as seen in instruments, etc., the polished parts of which resist rust. The influence of vitality is very small. The phosphates, etc., of lime in the dentine *may* be living matter, but he doubt-

Prof. Taft inquired what sulphurets were present in the mouth?

Dr. Black. Sulphurets of iron and lead.

Prof. Taft. If so they are in solution; and if this theory were true we should always find decay dark-colored. The iron present is very small in amount, sometimes none at all; he cannot accept that as a clear solution of the matter. Some things are difficult of solution, while some things we can readily understand. There is great diversity in the peculiar structure of the tissue itself; seldom are two teeth alike in microscopic structure. There is as much difference in this as in faces; there are variations in the enamel; sometimes it is soft like chalk, and sometimes like a diamond,—a file will not touch it; there is a difference in the openings in the enamel; it might be good to the eye but defective under the glass; there are open tracts, fissures, failures in fusion, all through enamel; the same is true of dentine to perhaps greater extent. These tracts denote non-union, and the conditions are favorable to disease. The differences in vital force vary as much as in any other organ. The phosphates of the dentine are either vitally endowed, or overruled and held by and interwoven with vital tissue. Teeth are susceptible to decay in a degree corresponding to the force of their vitality; there is no doubt about the presence of the vital principle; that removed and they drop at once. It must be maintained, toned up, built up, invigorated, to arrest decay. Compare two teeth, one dead and the other alive, and see which will resist the most; this will illustrate the power of vital force to maintain integrity of tissue, which is shown as markedly here as elsewhere in the body. Hydrochloric acid may be derived from the gastric juice and mucous membrane, but is not the product of decomposition. Most decay proceeds from acids, which overcome both the vital and mechanical forces. The dark color is the result of carbonization of the animal matter of the tooth. We sometimes find dentine as hard as enamel by reason of the consolidation of the tubules; soft dentine remaining under fillings becomes solid. A mechanical barrier is thus formed which arrests decay.

Dr. Knapp spoke of diet; nutrition has something to do with teeth as well as with the economy at large. In some conditions where decayed teeth are found, acids are produced; there are hereditary tendencies to loss of the teeth. The teeth suffer in cachexia, scrofula, and the like; acid conditions are produced by those diseases. We should carry these investigations further back.

Prof. Taft. Defects arise from two kinds of causes,—predisposing and exciting. There is nothing to be done for hereditary transmission but to keep the conditions as good as possible. We must rely after that upon meeting subsequent difficulty as it occurs.

Dr. Black does not deny that there are influences surrounding the phosphates tending to preserve them; one-thousandth part of hydro-

chloric acid is sufficient to decay teeth. The reason that devitalized teeth break down first is that the tubuli are open; this accounts for it at once. Has decay ever been observed to cease in these cases? He has seen six teeth in the same mouth remain absolutely stationary for five years; the fluids were alkaline, and the tubuli were blocked with insoluble substances—sulphurets. There are greater difficulties about the carbonization theory than about the sulphurets. Iron comes from the blood. Are teeth of animals found to decay? We know about as much about it as they did in the days of Greece, when disease was ascribed to a "bad condition of the humors."

Dr. —. Teeth of a skeleton do not decay. The causes are in the mouth; decay always commences between the teeth, where decomposed food lodges. Animal substances used for artificial teeth decayed in the mouth like natural teeth. The principal cause of decay is defective formation, supplemented by want of cleanliness. There is no cause for acid secretions except dyspepsia and decomposition.

Dr. Rebwinkel had supposed that the mischief was done in the night-time, when the fluids were not in motion.

Adjourned.

THIRD DAY—*Morning Session.*

The subject of "Causes Underlying Decay" being still under consideration,

Dr. Crouse said that he thought there was a contradiction between theory and proof in the account of the results of experiments given by Dr. Black. He (Dr. B.) has stated that the acids in motion produced much more marked effect upon teeth immersed in them than when at rest; and at the same time it appeared that the surfaces of the teeth presenting in the same direction as the current had been most cut away, while those where the most motion existed were least affected. He referred to the resistant action of nature in consolidating the dentinal tubuli; has a case in his own mouth, a considerable cavity of thirteen years' standing, now polished and hard. Good hygienic regulations will do a great deal, but preaching will not stop folly. If animals were fed as human beings are, with no exercise and bad air, their teeth, too, would decay. The great wonder is that the human family have any teeth at all, especially under the artificial life that prevails in cities, with its concomitants of want of air, sunlight, and fresh food. He could not see why people should crowd into cities and submit themselves to these influences.

Dr. Morgan combatted the idea advanced in one of the papers read, that a vegetarian diet is the only proper one for man. Animal food was recognized by the great law-giver, and he entered his protest against the vegetarian doctrine. Decayed teeth are the effect of civilization. Indians subsist largely on animal food, and have good teeth.

In scrofulous conditions, decay is the rule. In the mixed race of mulattoes, he had seen but two cases of freedom from decay in twenty-eight years ; and it is quite as rare among the black race, which are nearly all scrofulous. Never sees good teeth among syphilitic patients. The parents' teeth are sometimes good, but the progeny have defective ones.

Dr. Kulp knows of cases where abstinence from animal food has resulted in the production of good teeth. He had noticed a change of appearance in the teeth after this practice had been pursued ; they generally have perfect teeth.

Dr. Black explained in regard to Dr. Crouse's criticism on his experiments, that he had expressly stated that it was at the points where the current of acid was arrested or broken that the greatest effects were produced. The hard tissue formed by the consolidation of the tubuli was merely substitution of a material acted upon by acid for one that was not.

Dr. Richardson. We look too much at immediate causes,—acids or alkalies. Thinks if decay depended entirely upon chemical action we should have little trouble. For the effects we are indebted to this action ; but without predisposing causes we should have little decay. It is doubtful whether we ever would, except under peculiar circumstances. We must go back to the predisposing causes, which are intimately connected with nutrition. The subject is surrounded by difficulty ; but arrested or perverted nutrition, due to causes which exist during the formative period, is the main trouble. Doubts whether the administration of lime-salts will accomplish much. What is judicious treatment in one case would not be in another. In some cases there is an excess of lime-salts in the system.

Dr. Rehwinkel. We have been rushing to the front for ten or fifteen years. We should pause and go back to theories long gone by. Prof. Harris said if health were perfect, we should not know such a thing as decay. There is a tendency to investigate in one direction, and, though it is well that it is so, yet there is danger that we make that one direction a special pet, and think that we must defend our theory and attack every one who opposes. Papers are generally too lengthy and too diffuse. We *do* know something about this matter, as much as the medical profession do about their science.

A paper was then read by Dr. J. F. Hassel on the subject, "Is it Good Practice to leave the Dental Tubuli Open?" At the close of which Dr. Forbes remarked that the assertion that the Americans as a nation had bad teeth was unfounded. His experience was long and varied, and he believed that Americans possessed as good teeth as any nation on the globe. Not one Irishman in a hundred had sound teeth at the age of fifty years.

Dr. Crouse called attention to the Barnum testimonial fund, and requested subscriptions thereto, which were obtained to some extent.

(To be continued.)

CHICAGO DENTAL SOCIETY.

At the annual meeting of the Chicago Dental Society, held April 5th, 1874, the following officers were elected for the ensuing year:

President.—Dr. E. D. Swain.

1st Vice-President.—Dr. C. R. E. Koch.

2d Vice-President.—Dr. G. W. Nichols.

Corresponding Secretary.—Dr. J. L. Clapp.

Recording Secretary.—Dr. D. B. Freeman.

Treasurer.—Dr. Geo. H. Cushing.

Librarian.—Dr. C. R. E. Koch.

Executive Committee.—Dr. M. S. Dean, Dr. A. W. Harlan, and Dr. J. N. Crouse.

J. L. CLAPP, *Cor. Sec'y.*

JOINT MEETING OF THE CONNECTICUT VALLEY DENTAL ASSOCIATION AND MASSACHUSETTS DENTAL SOCIETY.

THE Massachusetts Dental Society has accepted the invitation of the Connecticut Valley Dental Association, and will meet in Convention at Ingleside Hotel, Holyoke, Mass., on the 9th and 10th of June.

Ingleside is delightfully situated on high ground, west of the Connecticut, overlooking Springfield, Chicopee, and Holyoke, and two days of rest here cannot but be pleasantly enjoyed.

Members of the profession are invited and requested to bring their ladies with them.

L. C. TAYLOR, *Sec. C. V. D. A.*

EDITORIAL.

AN ORAL HOSPITAL.

ONE of the most striking illustrations of the extension of medical science is to be found in the development of specialties in practice. The dividing line between medicine and surgery is becoming daily more decided, and, on either side, these are being again subdivided. And as one capable practitioner after another elects a special field of labor, the fruit of concentration begins to appear in more intelligent diagnosis and treatment in the class of cases which it includes; the literature of the subject is enriched by more valuable contributions, and the gain to humanity, as shown by the statistics of relief and cure, confirms the wisdom of the course. The next development in order is the association, for mutual improvement, of those who devote themselves to the study and treatment of the same class of diseases.

Presently, in the interests of the community, as well as to enlarge their experience by increased opportunities of observation and practice, a dispensary service is established, to which those afflicted are attracted by reason of the prominence thus given to their special maladies; and soon the convenience or necessities of patients, practitioners, and students suggest a special hospital.

Aggregating medical men as such, we have the National, State, County and City Associations; but these are too general to satisfy the needs of many, and thus, within a recent period, we have witnessed the establishment of a variety of organizations, composed of men drawn together by like proclivities—pathological, obstetrical, ophthalmological, biological, odontographic and other societies expressive of special pursuits and needs. So, too, we have medical colleges and general hospitals, but their lack is evidenced by the establishment and maintenance of schools of anatomy, colleges of pharmacy, dental colleges, etc., and by hospitals, infirmaries, and clinics for varied classes of patients. In Philadelphia, for instance, besides the general hospitals, special provision has been made for children, for the insane, for diseases of women; and an orthopædic hospital and infirmary for diseases of the nervous system, a dispensary for skin-diseases, and eye, ear, throat and dental clinics are maintained.

Evolution by natural selection seems to have governed the development of these various enterprises, as the law of the survival of the fittest will determine their permanence.

The time, we believe, however, is ripe for the establishment of another special hospital—one devoted to the treatment, surgical and mechanical, of oral and associate diseases. Such an institution, organized in the interests of science and humanity, would, we believe, attract those afflicted in this particular direction from all parts of the country, and the skill which increases with every opportunity of exercise would insure it a worthy renown. It would also, while attracting students, furnish the much-needed opportunity for observation and instruction. It is only by such means,—a clinic to which a multitude of cases would be attracted, that the student can be properly instructed.

As to the variety and importance of the lesions which it is thus proposed to group as a specialty, there can be no question; of their present inadequate treatment there need be no dispute; nor will any deny the force to be developed by concentration, nor the improved results which may reasonably be expected from it.

The field is by no means small, the harvest is ripe, and worthy laborers are few. If the dental profession, to which the work legitimately belongs, and which from its training could most readily occupy the ground, does not take the necessary steps to preempt, it must suffer

the mortification of seeing the labor performed by others, and lose the honor of inaugurating an enterprise which cannot much longer be delayed.

DENTISTS AND DOCTORS.

WE present in the Periscope of this number of the *DENTAL COSMOS*, under the captions of "Dentistry" and "The Annual Overflow," two articles from the editorial columns of the *Philadelphia Medical Times*. Without comment, at present, we commend them to the thoughtful consideration of the dental and medical professions respectively. Whatever of error they contain will do no permanent harm. Whatever of truth they embody should be pondered by those whom they principally concern.

THE ANNUAL CONVOCATIONS.

THE American Dental Association will meet at Detroit on the first Tuesday in August (4th), 1874.

The Southern Dental Association will meet at St. Louis on the last Tuesday in July (28th), 1874.

The American Dental Convention will meet at Saratoga Springs on the second Tuesday in August (11th), 1874.

The annual meeting of the American Dental Society of Europe will be held in Geneva, Suisse, on the 2d, 3d, and 4th of July, 1874.

HISTORY OF AMERICAN DENTISTRY.

IN our May issue we called attention to the proceedings of several associations in reference to the enterprise designated as above, and to a protest, numerously signed, against its publication. Since this number was in type, and this form made up, we have received two communications in reference to these proceedings and protest,—one from the publishers and one from the committee appointed to supervise the work.

On the principle of fair play for all, had these articles been received at an earlier day we should have given them the same prominence as had been accorded to the action referred to. Under the circumstances, we can only thus call attention to the two communications, and refer the reader to the department of Hints and Queries, where they will be found.

DEFERRED MATTER.

THE publication of the decision in the Rubber Case has compelled us to defer several articles which were in type and intended for this number. We must beg the indulgence of contributors.

BIBLIOGRAPHICAL.

DIAGRAMS OF THE NERVES OF THE HUMAN BODY. By **WILLIAM HENRY FLOWER**, F.R.S., F.R.C.S. Second American, from the second English edition. Edited, with additions, by **WILLIAM W. KEEN**, M.D. Philadelphia: Turner Hamilton. 1874.

This is a cheap and convenient edition of Flower's valuable work, admirably adapted for the student.

In six diagrams we have presented the principal nerves of the body, exhibiting their origin, divisions, and connections, with their distribution to the various regions of the cutaneous surface and to all the muscles. The arrangement is such that one can at a glance refresh his memory in reference to any particular nerve.

These plates should be in the library of every dentist.

A MANUAL OF TOXICOLOGY, INCLUDING THE CONSIDERATION OF THE NATURE, PROPERTIES, EFFECTS, AND MEANS OF DETECTION OF POISONS, MORE ESPECIALLY IN THEIR MEDICO-LEGAL RELATIONS. By **JOHN J. REESE**, M.D., Professor of Medical Jurisprudence and Toxicology in the University of Pennsylvania, etc. Philadelphia: J. B. Lippincott & Co. 1874.

The civil responsibilities of all who prescribe or prepare medicines for the sick, are based upon the reasonable assumption that the individual who accepts such trust shall possess educational qualifications to justify the procedure. Statutory provisions are necessary, not only to check abuses, but to encourage true scientific practice. It is in accord with the convictions of all thoughtful minds that the practitioner of the healing art should be held responsible to a civil tribunal for errors, which involve the life or health of the individual, or the usefulness of a limb or organ. No one has the right to prescribe a drug, lacking the knowledge of its nature, properties, and effects on the human system, and, if a poison, the antidotal treatment. Even if there were no legal accountability, it is incumbent on all who assume the solemn responsibilities of medical practitioners to acquit themselves to their own consciences by an intelligent appreciation of the toxicological effects of the drugs which they prescribe or use.

A manual of toxicology would, therefore, seem to be essential to the library of every one who prescribes for the sick.

The author of the volume before us has been identified with the literature of toxicology by the editorship of Taylor's *Manual of Medical Jurisprudence*—an accepted authority throughout the world—and by various contributions on the subject for a number of years, the book itself giving evidence of his thorough familiarity with the subject.

The style of the author is simple, and his aim seems to have been to convey his meaning in the most direct and plainest manner. The recognized authorities of America and Europe are freely quoted and credited, which adds to the completeness of the volume.

The paper and typography are unexceptionable; we commend the book as a valuable compend of toxicology.

OUTLINES OF COMPARATIVE ANATOMY AND MEDICAL ZOOLOGY. By HARRISON ALLEN, M.D., Professor of Zoology and Comparative Anatomy in the University of Pennsylvania. Second Edition. Philadelphia: J. B. Lippincott & Co. 1874.

The author of this treatise is already favorably known as an excellent surgeon and admirable clinical instructor, as well as lecturer upon Zoology and Comparative Anatomy in the University of Pennsylvania, and upon Anatomy and Surgery in the Philadelphia Dental College. No further introduction, however, to the dental profession is needed, than a reference to his communications in the DENTAL COSMOS, especially to the series of able articles now in course of publication in its columns, upon "The Facial Region."

This work was designed with a special view to its utility as an *educational book*, and the intention is well carried out in its pages. Though modestly claiming to be only the "outlines" of the subject, a careful perusal will convince the reader that the whole field has been well explored. A vast multitude and variety of facts are clearly, systematically, and concisely stated, making the volume valuable, not only to the student, but for reference by those who desire to refresh their memory on any point connected therewith. The work may in many respects be considered a *synopsis*, though fuller than the volumes to which that word is usually applied.

This book is exceedingly well adapted to the needs of dental and medical students, for which class indeed it was specially designed. A knowledge of at least the outlines of comparative anatomy is not merely desirable, but absolutely essential to a philosophical appreciation of the structure and functions of the human organism. No one who is ambitious to be considered worthy the name of a *dental specialist* can afford not to know at least so much of the comparative anatomy of the teeth as is so methodically and intelligibly presented in the volume before us. The author's purpose, as before stated, was to make it useful as an educator, and no higher commendation can be desired than the testimony that his design has been admirably fulfilled.

A TREATISE ON PHARMACY: DESIGNED AS A TEXT-BOOK FOR THE STUDENT, AND AS A GUIDE FOR THE PHYSICIAN AND PHARMACIST. CONTAINING THE OFFICIAL AND MANY UNOFFICIAL FORMULAS, AND NUMEROUS EXAMPLES OF EXTEMPORANEOUS PRESCRIPTIONS. By EDWARD PARRISH. Fourth edition, enlarged and thoroughly revised, by THOMAS S. WIEGAND. With two hundred and eighty illustrations. Philadelphia: Henry C. Lea. 1874.

Ten years have elapsed since the appearance of the previous edition of this valuable book,—a decade marked by an unusual advance in pharmaceutical science, as also by a reconstruction of chemical nomenclature. During this period, the national Pharmacopœia has also been revised, and the many and important changes therein contained rendered a new edition of this text-book a necessity, and its revision a work requiring great care and judgment.

We are glad that the responsibility was intrusted to one who has demonstrated his ability to carry out the plan of the lamented author with such discretion and faithfulness as is manifested in the present edition.

This treatise may fairly claim to embody all that the physician or pharmacist can ask for in such a volume. It must be an indispensable companion to the apothecary and country practitioner, while the varied and full information on all matters relating to drugs, the processes and manipulations required in their preparation and combination, the relations of pharmacy to chemistry, and the art of extemporaneous prescription, should make it an acceptable addition to the library of every one who has occasion to prescribe or prepare medicines for the sick, as well as to that of every one who desires a ready reference for information on such matters, which, more or less frequently, is needed by all.

We congratulate the pharmaceutical profession on the status which such a volume implies and the progress which it indicates.

THE ANÆSTHETIC REVELATION AND THE GIST OF PHILOSOPHY. By BENJAMIN PAUL BLOOD. Amsterdam, New York. 1874.

This volume we might be tempted to style profound, if we could comprehend it; but, as the case stands, obscure is a more descriptive appellation. We do not understand the object, the argument, nor the conclusion. We cannot discover the "revelation" nor appreciate the "gist" of the "philosophy;" in a word, we do not perceive what the writer desires to assert or prove.

The author is unquestionably a scholar, and the volume before us may be studied with advantage as a brilliant specimen of the asserted value of language—to conceal ideas. We commend the book to the kind regards of transcendentalists and metaphysicians.

VULCANITE LITIGATION.

WE have just received, and herewith publish in full, the opinion of Judge Shepley in the case of the Goodyear Dental Vulcanite Company and Josiah Bacon against Dr. Daniel H. Smith.

This is another step in the progress of this case; the next one will probably be the appeal to the Supreme Court of the United States.

An agreement having been made between counsel to complete and try the Massachusetts suit as a test case, the test cannot be considered as applied until it has passed through the tribunal of last resort.

SAMUEL S. WHITE.

CIRCUIT COURT OF THE UNITED STATES, DISTRICT OF MASSACHUSETTS. IN EQUITY.

THE GOODYEAR DENTAL VULCANITE COMPANY ET AL. v. DANIEL H. SMITH. OPINION OF THE COURT. [MAY 8th, 1874.] SHEPLEY, J.

LETTERS Patent of the United States, issued June 7th, 1864, to John A. Cummings, for Improvement in Artificial Gums and Palates. The Bill in Equity in this case is filed against the defendant, alleging infringement of the Letters Patent which, upon a surrender of that patent in accordance with law, were reissued to the Dental Vulcanite Company, the assignees of the title in and to the Letters Patent, upon the 21st of March, 1865. While the patent describes the invention as "an Improvement in Artificial Gums and Palates," the patentee gives a better description of his invention in his specification in his original patent, in which he claims to have invented certain new and useful improvements in the manner of forming artificial palates and gums used for inserting artificial teeth. The claim in the patent is for "The plate of hard rubber or vulcanite, or its equivalent, for holding artificial teeth, or teeth and gums, substantially as described." This claim of the patent has been construed in this Circuit, in the cases of Dental Vulcanite Co. v. Wetherbee, 2 Clifford, 555, and the same v. Benoni E. Gardner. The substance and effect of the determination of the Court in those cases is, that the invention claimed was the described

product and manufacture by the means described in the specification. Adopting the construction given in those cases to the claim in the patent, I know no better description to be given of the invention patented to John A. Cummings and reissued to the complainant than this, that it is for a new article of manufacture consisting of a plate of hard rubber or vulcanite with teeth, or teeth and gums, secured thereto in the manner described in the patent. The patent is not for a process or art, but for the new product resulting from the manipulation by the described new process. It is one of those products, as will be seen by examination of the specifications describing the process of manufacture, in which the process so inheres that the described product can only be made by the described process. The patent is not for a dental plate of vulcanite or hard rubber alone; it is not the substitution of the old material, vulcanite, in place of the gold and other materials which have been before used in the same way; it is not, as claimed by defendant, for a dental plate of hard rubber vulcanized in moulds in the manner described in the patent; but it is for a set of artificial teeth as a new article of manufacture, consisting of a plate of hard rubber or vulcanite, with teeth, or teeth and gums, secured thereto in the manner described in the patent, by imbedding the teeth and pins in the vulcanizable compound, so that it shall surround the teeth and pins while the compound is in a soft state before it is vulcanized, so that when the compound is vulcanized the teeth are firmly secured by the pins imbedded in the vulcanite, and there is a tight joint between the vulcanite and the teeth. This manufacture was a new manufacture, new as to the thing made, new as to the process of making it, considering that process as a whole. The invention is not like that of a machine, but is one in which the process by which it is made is a part of the substance of the thing made, the manufacture, and a characteristic feature of its construction. It is evident from an examination of the very brief and imperfect description of the invention given by Cummings in his caveat filed as early as May 14th, 1852, that he fully appreciated the fact that the importance of his invention consisted not merely in the substitution of a material "rigid enough for the purposes of mastication, and pliable enough to yield a little to the mouth," in place of the "hard, unyielding" metals previously used, and not merely in the substitution of a material light and inexpensive in place of the expensive and heavy materials before used for the plate, but also in the additional fact which he states, that "by this improvement the teeth can be easily baked into the gums, which form one piece with the plate." This statement, at that early period, sufficiently suggests that he fully appreciated the advantages of the material which he used, and which was capable of being so used in the process as to insure that cleanliness and purity resulting from the absolutely perfect joint formed between the teeth

and the plate, and the consequent absence of any crevices for the retention of food.

In the specifications of the reissued patent, after adverting to the fact that the method previously in use of attaching artificial teeth to a metallic plate fitting to the roof of the mouth was attended with many objections and inconveniences, he states his invention to consist "in forming the plate to which the teeth, or teeth and gums, are attached, of hard rubber or 'vulcanite' so called, an elastic material possessing and retaining in use sufficient rigidity for the purpose of mastication, and at the same time being pliable enough to yield a little to the motions of the mouth." He then describes what he calls his "manner of making and using said hard rubber plates," but which would be more appropriately described as his mode of forming and making a set or case of teeth, including the plate, gums and teeth. A wax or plaster impression of that part of the mouth which the plate is to fit is first taken, and from that impression a plaster cast is made which will exactly resemble that part of the mouth from which the first impression was taken. A plate of wax of the general form of the intended rubber plate is then made from this plaster cast, and around the front of this wax plate a vertical ridge of wax is fixed, about in the same position which the teeth are to occupy, in the same manner as is generally practiced in the construction of gold plates for artificial teeth. A plaster mould is then made from this wax plate, fitting it both on the upper and under side, which plaster mould is known, generally, as the articulator, and is constructed so as to hold the wax plate securely and conveniently for manipulation, leaving the front edge, where the teeth are to be applied, exposed and accessible. The specification then describes the kind of teeth which may be employed, and says, the mode of operation is the same, whether the teeth have porcelain gums formed in one piece with the teeth and properly colored, or teeth without porcelain gums, in which case the palate and gums are formed of one piece of hard rubber; the mode of operation is the same, whether gum teeth or teeth alone are used, either singly or in groups. The teeth are set in place in the wax plate, and adjusted to the proper distance and fullness in the same manner as is generally practiced in setting teeth in gold plates. The wax plate and gums, with the teeth adhering thereto, is now set upon the original plaster cast of the corresponding part of the mouth, and plaster is poured all around up to about the lower edge (as it lies) of the wax plate. The margin, or outlaying surface of plaster, is oiled or varnished, and plaster poured over the whole, forming a complete mould of the plate and teeth. Upon the opening of this mould, the wax is warmed and removed, so as to leave the teeth adhering in the plaster mould in exactly the relative position they are to occupy in the hard rubber plate. The teeth are provided with pins

projecting therefrom in such manner that the rubber which is to constitute the plate will close around them, and by means of them hold or secure the teeth permanently in position. The plaster mould with the teeth adhering therein, as just described, is now filled with soft rubber, a little at a time, pressed in with the finger, or any other convenient way; and care is to be taken that the rubber is made to completely fit into the cavities, and around the protuberances including the pins, and is filled to the thickness or depth desired to form the plate. The rubber plate is then locked in position by shutting the other half of the plaster mould over it to insure its retaining its exact form, and it is then subjected to sufficient heat to harden or vulcanize the compound.

While respondent admits that this process or mode of constructing the plate or case of teeth, which is included in the claim of the reissue, constitutes a substantial and material part of the thing patented therein, yet he insists that it was not described or suggested or indicated in the original patent of June 7th, 1864, but was interpolated in the reissue, which is therefore invalid, having been granted contrary to law.

Since the exhaustive exposition of this branch of the law of patents in the case of *Seymour v. Osborne*, 11 Wallace, 516, the principles of law applicable to the consideration of this question are too well settled to admit of any doubt. Where the Commissioner accepts a surrender of an original patent and grants a new patent, his decision on the premises in a suit for infringement is final and conclusive, and is not re-examinable in such suit in the Circuit Court, unless it is apparent upon the face of the patent that he has exceeded his authority, and that there is such a repugnancy between the old and the new patent, that it must be held as matter of legal construction that the new patent is not for the same invention as that embraced and secured in the original patent. Reissued Letters Patent must, by the express provisions of the statute authorizing them, be for the same invention, and consequently when it appears on a comparison of the two instruments as matter of legal construction that the reissued patent is not for the same invention as that embraced and secured in the original patent, the reissued patent is invalid, as that state of facts show that the Commissioner in granting the new patent exceeded his jurisdiction. The patentee may amend what is defective or insufficient in the description of his invention, but he cannot make any material additions to the invention claimed in the original, by interpolating in the reissue anything not described, suggested, or substantially indicated in the original specifications, drawings, or patent office model. The claim of the respondent is that, in the reissue No. 1904, a new process of forming the plate is substituted for the one described in the original patent; and that the new process described was not suggested or indicated in the original patent. To properly determine this ques-

tion we must carefully examine the two specifications to ascertain what steps in the described process are claimed as new as distinguished from those steps in the process which were old. The plaster moulds or the manner of using them, or of the wax in connection with them, are not described or claimed as new. What is described and claimed as new in the process is, in substance, the making of a vulcanite dental plate out of a vulcanizable rubber compound into which the teeth were imbedded in its plastic condition, and the rubber compound, with the teeth thus imbedded in it, afterwards vulcanized by heat so that the teeth, gums, and plate should be perfectly joined without any intervening crevices, and the plate should possess the qualities of hard rubber or vulcanite. All that is involved in this statement is clearly indicated in the original patent. It is true that the patentee does not describe in detail precisely how the teeth were to be imbedded in the plastic compound, before vulcanization, as fully as he states it in the reissue, but he does substantially indicate and describe the new manufacture, and all that is claimed in the reissue. Upon a comparison of the two patents, and an examination of the specifications and of the drawings, the Court cannot arrive at the conclusion as a matter of legal construction of the instruments, that the reissued patent is for any different invention from the one substantially indicated in the original. It is insisted in argument that Cummings did not, in his original application, describe a vulcanizable compound, because he says "the teeth, gums, and plate are then baked until the rubber or other elastic material becomes sufficiently vulcanized." This description it is contended does not apply to vulcanite, because the soft rubber is not elastic before vulcanization. But when we take the whole description, it is plain that he does not intend by the expression "or other elastic material," to apply it to the rubber in its soft, plastic or putty-like condition, but to a material which may be an elastic material either before its reduction to the soft condition or after its vulcanization. This meaning, however imperfectly expressed, is easily gathered from the whole description, which plainly designates the material to be used as rubber, and the compounds commonly employed therewith, reduced to a soft plastic condition capable of vulcanization and subsequently vulcanized.

The respondent also seems to have misapprehended the language of the Court in *Goodyear Dental Vulcanite Co. v. Gardner*, where it is said, speaking of the claim, that "it includes not only the plate of hard rubber for holding artificial teeth or teeth and gums, but the process or mode by which they are constructed." It is contended that this construction makes the use of the moulds "the process or mode by which they are constructed," and that inasmuch as the moulds were not described in the original, the reissue is broader than the original,

and inasmuch as the use of such moulds for this purpose was not new, the patent is void. But, upon reading the opinion in that case, it is clear that no such construction as is contended for, was given to the claim. The process of forming a plate by the use of plaster moulds was well known; the process of retaining and confining the vulcanizable compound in the mould until it was converted by heat into hard rubber or vulcanite was well known to those skilled in that art, and for that reason perhaps Cummings considered it unnecessary to describe minutely those details of the process in his original application. But upon the suggestion that these steps in the process were not known to those skilled in the art of *dentistry*, a reissue was taken which more at length described all the steps of the process. In view of the construction heretofore given to the claim, and in view of the evidence in this record, which shows that the use of such moulds in the described mode, and for the described purpose, was known to those skilled in the art, it is at least doubtful if there was any necessity for a surrender and reissue. Such an use of moulds was not "the process or mode by which they are constructed" referred to by the Court in the sentence above quoted from *Goodyear Dental Vulcanite Company v. Gardner*. What the true construction is, as given by the Court in that case, we have before stated, and need not repeat.

It is again in this case most strenuously contended that Cummings was not the original and first inventor of the thing claimed by him, or a material and substantial part thereof. Considering the importance of this question, the great pecuniary interest involved, the public interest as well as the interests of the many thousand licensees under this patent in the dental profession, and the thousands who are alleged to be using the patented invention without license, and in view of the fact that this has been made a test case, and carefully prepared and presented to the Court with all the light that can be thrown upon the history of the art by careful and scientific research, I have carefully considered the evidence in the record upon the question of novelty as if this were the first case in which this issue was presented. The first step in the solution of this question is to fix the date of the invention of Dr. Cummings. The caveat filed by him on the 14th of May, 1852, substantially describes his invention; and if there can exist any doubt that it was perfected at that time, there can be no question that it was perfected and reduced to practice in the latter part of 1854, or early in 1855, and before he filed his application for a patent on the 12th of April, 1855.

It is insisted on the part of the respondent that Cummings allowed his invention to be used freely and fully by the public before his application for a patent, and acquiesced in and permitted and assented to such use without asserting any claim or right thereto, and thereby

waived and abandoned the same, and dedicated it to public use, and thereby forfeited any right he might have had to Letters Patent for his invention. Support to this theory of the defense is sought in the fact of the long space of time suffered to intervene between February 6th, 1856, when his first application was rejected by the Commissioner, and his subsequent application in 1864. He did not after this rejection exercise his statute right to withdraw his application and receive back his fee of twenty dollars; and although he did not appeal from the Commissioner, he persisted in his claim for a patent. In the case of *Godfrey v. Eames*, 1 Wallace, 317, the Supreme Court decided that if a party choose to withdraw his application for a patent, intending at the time of such withdrawal to file a new petition, and he accordingly do so, the two petitions are to be considered as parts of the same transaction, and both as constituting one continuous application within the meaning of the law. But Cummings did not withdraw his application, or in any manner acquiesce in the rejection. On January 17th, 1859, his solicitor applied to the Commissioner for the specification and drawing. When the Commissioner declined to return the specification, additional counsel was employed in Washington to make an examination, and endeavor to secure a patent. The counsel discovered in the reasons which had been given for the rejection that a palpable error had been committed, and applied for a rehearing, or for an appeal to the Board of Examiners. This application was also refused. Cummings was then poor,—too poor to pay the expenses necessary to a persistent and successful prosecution of his application. Constantly persisting in the assertion of the importance and great value of his invention, he wearied his friends with his importunities for the means necessary to prosecute his claim and secure his patent, even offering in vain one-half of his patent for the means necessary to secure it. He finally prevailed upon Flagg & Osgood to assist him with means, and on the 1st of March, 1864, he made a new application which was filed March 25th, 1864. On the 7th of April, 1864, the office replied to him: "Your present claim is embraced in an application filed by you in 1855, and rejected for want of novelty." The Commissioner admits that although three times rejected, his former claim and specification, as amended before such rejection so as to confine it to hard rubber or vulcanite, was improperly rejected, "the case of *Stearns's vulcanized rubber palate and velum*, to which you were then referred, having no bearing whatever upon your invention." After the new application was amended at the suggestion of the Commissioner, so as to limit the claim and specification to make it conform to the original application as amended, the patent was issued on the 7th of June, 1864, which the Commissioner thus decided he was entitled to have received on his application of April 12, 1855. That under such cir-

cumstances he neither lost, nor did the public acquire against him any rights by their unauthorized use of his invention during the time after his application was made, when he was doing all in his power to secure a patent, is clear on principle, and well settled by the authorities. It is only necessary in this connection to refer to the very able opinion of Judge McKennan upon a similar state of facts in the case of *McMillan et al v. Barclay*, which leaves nothing more to be said upon this branch of the case; and if further authority be needed, it will be found in the opinion of Mr. Justice Clifford, in *Jones v. Sewall*, Maine District, April T., 1873.

Upon the question of novelty, the construction which has been given to the claim renders it unnecessary that any particular allusion should be made to the foreign patents or publications, or to the great mass of the evidence in the record exhibiting the state of the art prior to the patented invention. For it is not even claimed in argument that before the date we have ascribed to Cummings's invention any other person had successfully made what we have defined as his new manufacture, namely, a set of artificial teeth consisting of a plate of vulcanite with teeth, or teeth and gums, secured thereto in the mode described in the patent, by so imbedding the teeth, with the pins which help to secure them, in the vulcanizable compound, in its soft and unvulcanized state, as to make a perfect joint after vulcanization. It is, however, claimed that, with gutta-percha, tin, platinum and porcelain sets of teeth had been made by a process substantially like that of Cummings, differing in substance from it only in the material used for the base. It is claimed that this is the mere substitution of one known material for another, and, therefore, not patentable. It is first to be remarked that the process which is new in the Cummings invention, by which the new patented manufacture is made, is not, as defendant supposes, the process of making the moulds, but the process of moulding, forming, and making the united plate and teeth or set or case of teeth. Without, therefore, considering in this connection the question whether the same process had ever before been used in the manufacture of a plate with teeth or teeth and gums imbedded in it, so as to make a tight joint, and in effect, so to speak, a perfect union, using for a base a material other than vulcanite, it may be well to consider, upon the hypothesis assumed by the defendant, under what conditions such a substitution of an old material would or not be patentable. This is not, in any proper sense, a case of double use. It is claimed that the case at bar falls within that class of cases, like *Hotchkiss et al v. Greenwood*, 11 Howard, 248. In that case a knob of porcelain or clay, such as were in common use for door-knobs, was attached to a metallic shank or spindle, by making the cavity in the knob in which the shank or screw is inserted, largest at the bottom of its depth in form of a dovetail, and a screw formed

therein by pouring in metal in a fused state. The knob was not new, nor the metallic shank or spindle, nor the means by which the metallic shank was securely fastened therein. The only new thing was the substitution of a knob of clay in that form in that combination in place of a knob of wood or metal. The jury were instructed in the Circuit Court that, if no more ingenuity or skill was required to make this change and construct the knob in this way than that possessed by an ordinary mechanic acquainted with the business, the patent was invalid. The Supreme Court, in sustaining the instructions given in the Circuit Court, which were the subject of exception, say (Mr. Justice Nelson delivering the opinion), "The difference is formal and destitute of ingenuity or invention. It may afford evidence of judgment and skill in the selection and adaptation of materials in the manufacture of the instrument for the purpose intended, but nothing more." The case, when carefully examined, decides only that "a machine made in whole or in part of materials better adapted to the purpose for which it is used than the materials of which the old one is constructed, and for that reason better and cheaper, cannot be distinguished from the old one, and, in the sense of the patent law, cannot entitle the manufacturer to a patent." The case of *Hotchkiss et al v. Greenwood*, as the facts had been found by the jury, and as they were assumed in the opinion of the Court, presented nothing more than the naked substitution in the same combination of one material for another, without any attending difference in function or effect. It was precisely as if a patent had been claimed for substituting, in the same contrivance, a silver knob in place of a brass one, or one plated with gold, instead of one plated with silver, or one plated with gold or silver on a base metal, instead of the base metal knob. The mere exercise of taste or judgment, without invention, in the selection and substitution of materials, is not considered by the Court, in that case, sufficient foundation for a patent. But it is not to be lost sight of in considering the case of *Hotchkiss et al v. Greenwood*, that when the counsel contended that the mode of fastening the shank to the clay knob produced a new and peculiar effect upon the article beyond that produced when applied to the metallic knob, inasmuch as the fused metal by which the shank was fastened to the knob prevented the shank from acting immediately upon the knob, it being inclosed and firmly held by the metal; and that, for this reason, the clay or porcelain knob was not so liable to crack or be broken, and was made firm and strong, and more durable. The Court disposed of this point, not by deciding that such difference of effect would not be patentable if new, but by saying that this peculiar effect on the clay knob, as compared with the old metal knob, was not distinguishable from that which would exist in the case of the wood knob or one of bone or ivory or of other materials that might be mentioned, which

were old. In effect the Court decided that the peculiar effect claimed was not new, and, therefore, not patentable, and not that the combination might not have been patentable, had any effect been shown which was new, peculiar, and useful. If the knobs of porcelain or clay used by the complainants in that case had been new, or if, being old, the complainants, by a novel use of them in the old combination, had accomplished a new and useful result, differing not merely in degree, but in kind, from the result of the old combination, the patent would clearly have been valid, and the case cited is certainly not an authority to the contrary. Strictly speaking, no new manufacture is anything more than a new combination and arrangement of old materials; and whenever such new combination and arrangement produces a new and useful result, there being diversity of method and diversity of result, the invention is patentable. The utility of this invention is shown by the vast numbers of persons making use of it both as licensees and infringers. To overcome the presumption that it is a new manufacture arising from the grant of the letters patent, the respondent has not introduced the opinion of any expert who is willing, in view of the state of the art as known to him and proved in the case, to testify that this was not, at the date of the original application, a new manufacture. Reliance is placed upon the evidence introduced in the case by the respondent, to convince the Court of the fact, upon which respondent's experts were not convinced, that the manufacture patented, as distinguished from those which had preceded it, was not a new manufacture. The nearest approximation to the process of manufacture used by Dr. Cummings is, perhaps, to be found in the experiments of William A. Royce and George E. Hawes in casting a base of pure tin in a mould in the same manner, substantially, in which the vulcanite base is moulded. If these had been successful, instead of abandoned experiments, they would not have furnished any obstacle to the granting of letters patent to Cummings, for reasons clearly apparent. Hawes cast rude sets of teeth in this way for the lower jaw only, the weight of the tin, when made of sufficient strength out of this soft metal, rendering them impracticable for upper jaws. The shrinkage of the metal, when cooling, rendered it impossible to fit the plate accurately to the mouth, and rendered difficult, if not impossible, a tight joint between the base and teeth, to prevent the set from becoming offensive by the deposit in the crevices of food and fluids from the mouth. The extreme heat of the molten tin was communicated to the metal pins, causing them to expand, and resulting in a consequent liability, by their expansion, to crack the porcelain teeth. The tin, also, was subject to corrosion by the chemical actions of the fluids of the mouth. Royce had also made three cast-tin plates prior to 1850. He abandoned the experiment, making no more after that time. Yet Hawes testifies that the use of vulcanite

for dental purposes is the greatest improvement in the profession known to him for twenty-five years; and the testimony of Hawes and Royce alone, given, as it is, by very intelligent and practical members of the dental profession, would be sufficient to prove the utility of the invention, and to distinguish it as a new manufacture as compared with anything known in the prior history of the art. Without going into a detailed examination of the Wildman plates, made by casting tin around the roots of the teeth upon gold or silver plates, the unsuccessful attempts to use gutta-percha, the experiments of Dr. Hill with a secret compound of gutta-percha and some metallic salt, it is sufficient to state that none of these, much less any of the printed publications of which notice is given in the answer, suggest or describe an article of manufacture substantially like that described and claimed in the reissued patent on which this suit in equity is based. Upon a careful review of all the evidence in the record, I have no hesitation in coming to the conclusion that the invention of Dr. Cummings was a new and useful manufacture, that nothing appears in evidence to show that he was not the original and first inventor of the thing claimed by him, that the reissued patent in suit is a good and valid patent, and that the defendant has infringed the same, as alleged in the bill.

Decree for complainant for injunction and account, as prayed for in the bill.

PERISCOPE.

DENTISTRY.—The amount of angry comment which the little birds of whom Solomon speaks have brought to our editorial sanctum, concerning an article on oral surgery that appeared some time since in our columns, has astonished and, we may add, amused us. The most plausible explanation is to be found in the fact that the members of the profession supposed to have been slighted really know that they are laying claim to a position for dentistry which it does not at present deserve, and which the world does not grant. A condition of extreme general peripheral sensitiveness marks the existence of a spinal or centric nervous weakness in the moral as well as in the physical world, and nothing is so inductive to the production of this weakness as the knowledge that we are claiming or pretending to what we do not possess. The real duke laughs when he is taken for a commoner, but the shoddy duke flies into a passion. When any one knows he is right, he is usually tolerant of discussion. In this innate sense also lie, we suppose, the sources of the self-laudatory speeches which are so abundant at dental conventions. The true Hercules does not deem it necessary to be always proclaiming his strength, or the man of robust health to be constantly telling his friends that he is well.

Whether our explanation of the exceeding sensitiveness of our friends the dentists be or be not correct, the fact remains that dentistry is not looked upon at all by the medical profession as in the slightest degree co-equal with medicine, that the degree of *doctor* of dental surgery is

viewed with a great deal of amusement and a little vexation, and that the claim that dentistry is a branch or specialty of medicine is generally met by internal cachinnations, whatever external behavior the laws of politeness may enforce. These may be hard things to hear, but we hope our dental friends will not be angry; they are not the opinions of the *Times* or of its editors, but are the simple facts of the case,—facts which it behooves those who wish to see dentistry placed upon a higher plane to recognize.

We are not now speaking of dentists, but of the dental profession. There are many dentists of the highest culture and of the most worthy social characteristics, precisely as there are such men in all of the higher walks of life; but certainly, even if dentistry in the abstract is worthy of a position as a medical specialty, the living, concrete dentistry can only gain such honor by a complete reorganization of the profession.

The dentist formerly acquired his art in the office of his predecessor, and it was not considered necessary for him to study in any more extensive sphere. As time went on, and the lucrativeness of the calling attracted more and more able and cultured men, aspirations rose higher and higher; dentists began to demand a more extensive education, and the dental colleges were founded. But now another step is being attempted, and a claim is put forward for a recognition of dentistry as a medical specialty.

In considering this claim, the great difference between dentistry and such real medical specialties as ophthalmology must not be lost sight of. In the first place, dentistry originated, or at least has grown up, entirely outside of the medical profession, whilst the true specialties have originated and been cultivated solely inside the profession. In the second place, dentistry constantly asserts itself as something outside of the medical profession, whilst the specialties do not. Every dentist announces himself as such upon his door-plate or window-sill, whilst a ban is laid upon the man who labels himself in the same way as an oculist or an aurist. In the third place, the dental profession is saying to the world day in and day out, by its actions, that a general medical culture is of no use, or at least is not a necessity to the dentist, whilst the specialist insists that before special studies are undertaken the candidate must have had a thorough general medical education.

The dental colleges have been a great aid to the dental profession, and, indeed, whatever claim dentistry really has to be called a profession rests almost exclusively upon their labors. Yet they are an insuperable bar to its ever becoming a medical specialty, and the degree of D.D.S. is the badge of a partial culture which must shut out from the medical ranks every one who wears no other insignia,—a fact of which the dentists seem painfully aware, since so soon as any one of them takes a degree in medicine the D.D.S. disappears in a twinkling from door-plate and window-shutter. So long as the dental profession, by their deeds, say that such half-culture is all that is necessary for a dentist, why should the members complain if the world and the *Times* agree with them and assign to dentistry the position which it at present holds?

There is only one way by which a higher position can be achieved, and the first step is the abolition of the dental colleges and an enforcement of the idea that a general medical education must precede the

special one. If we are correctly informed, at a recent meeting in New York, Dr. Robert Arthur, a prominent dentist of Baltimore, proposed that students entering the specialty should graduate in medicine and afterwards pursue special studies under suitable instruction, or else that the student should select such schools as afforded, during the summer, special courses of lectures, and other facilities for studying dentistry.

The latter seems to us a most happy idea, and, if dentists are to be doctors, the plan suggested is the most feasible. It appears to us that it would certainly be to the interest of the medical schools to offer the facilities; and although, as stated in a previous editorial, we do not perceive the necessity for this general culture in those who practice dentistry, and doubt the possibility of enforcing any expensive education upon the students, yet it may be that on trial we shall be found to be mistaken. This much we can assure our friends the dentists, that just so soon as they comply with the universally adopted rules of the medical profession, and measure up to its standard, that profession will receive them with open arms,—not because they are dentists, but because they are doctors.—*Philadelphia Medical Times*, May 16th, 1874.

THE ANNUAL OVERFLOW.—Next week the profession will be more numerous by some hundreds than it was before the colleges flung open their doors and let the anxious crowds come out. The profession grows in numbers by the annual increment, but does it grow in power? We fear not. As the addition of new links of imperfect workmanship lengthens but weakens a chain, so, it seems to us, does the yearly growth increase but weaken the profession. It appears to be in the first place indisputable that the influence of the profession, so far from growing stronger, really lessens with age. To-day, in circles where formerly the physician was held in high esteem, he is looked upon as a puzzle, a problem, a *lusus naturæ*, a something removed from the common humanity; and in other circles of power regular medicine, quackery, imposture, and ignorance are jumbled into a mass, and the profession is weighed by the general average.

The reasons of the declension of physicians in public esteem are no doubt manifold; but the roots of all these causes seem to us to take life upon Commencement-Day. In the yearly outpouring of semi-educated men is furnished the leaven that is leavening the whole lump.

We know that many of the professors see with the clearness of proximity the sources of evil, and sadly acknowledge the gravity of the trouble. Yet they are powerless to alter or reform: the instruments of an organization, they are responsible only for the method in which they perform their assigned duties. The demand made upon them by some of the profession that they change the system has seemed to us ludicrously unjust, if not absolutely impudent. This may appear strange to some; but, as our columns are crowded, we must leave the development of our reasons for another issue.

In our editorial of last week we advanced the propositions that the medical colleges (as at present organized) are the enemies of the profession, and that the faculties are not to be blamed for this, and are to be expected to alter it. The deficiencies of our educational

are so generally admitted that they scarcely need any further illustration than that which we gave last week. In the various discussions upon the subject which we have listened to, however, we have never yet seen any one who was bold enough to tell the whole truth; and to-day, at the risk of incurring the curse which the Jewish Bible laid upon those who uncovered the nakedness of their parents, we propose to say some things which we believe the profession needs to look squarely and honestly in the face; for, in all earnestness, it seems to us that, in spite of the clamor, we are somewhat in the position of the man who dares not be honest to himself and place his deeds and his character at the judgment-seat of his own reason.

The *theory* of medical education at present is that the candidate studies a year and a half in the office of some practitioner, and then attends two courses of lectures before he graduates, making, in all, a term of three years. The *fact* is that a large proportion of the candidates really study only one year and a half, and some only one year.

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The knowledge which the examining board has as to the time during which the candidate has prosecuted his studies is often derived solely from the statements of the candidate himself, and from his having bought two sets of tickets. We know that at least sometimes untrue statements pass unchallenged: so that the man who has not, except on his thesis-paper, even pretended to study for more than a year and a half, is recorded before the degree-conferring power as a three-years' student. These things being so, it is evidently preposterous to claim that our graduates are students of three years' standing. What is the examination that tests the fitness of candidates thus prepared? Performed by men whose bread-and-butter depends upon the number that they let through,—performed by these men in secret, with no responsibility to any power but their own consciences,—performed with the knowledge, or at least with the belief, that if they do not dub the medical knight a rival organization will do it for him gladly,—performed under these circumstances, the examination cannot be anything other than it is, i.e., an apology to public opinion, the last act of a farce before the tragedy commences.

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How can a profession be honored that sells its birthright for a mess of pottage? How can any body of men be distinguished as a whole, when a few hundred dollars and a few months' work give admission to the ranks? It is hard to tell whether to laugh or to cry over the solemn farces of Commencement-Day; but assuredly the spectacle of grave critics searching assiduously for the causes of the profession's low estate, when the mud of the quagmire is upon their very persons, is most laughable.

Unless these critics are the blindest leaders of the blind, they must be hugging delusions that they may hide that which they are afraid to see, and may quiet the fancies of uneasy consciences. The marvel is not that we have so little, but that we have so much, of public confidence. The reason that we are still looked upon with a measure of esteem is that there are numbers of medical students who feel deeply the responsibilities of their position, and avail themselves of the opportunities offered to become really educated physicians; the fault of the colleges being not that they do not afford sufficient opportunity to those-

desirous of eminence, but that they do not require the student to prepare himself thoroughly before granting him a diploma.

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It is evidently folly to expect reform to come from within the faculties. A board of trustees, having the power and having themselves no pecuniary interest in the matter, may force the faculty into the change. But, unless they attach salaries to the chairs, such proceeding, although for the general good, would be arbitrary and unjust to the professors. Especially, however, is it unjust in the profession to expect the faculties to originate reforms. In the proposed changes the professors have nothing to gain and everything to lose, whilst the profession has everything to gain and nothing to lose. What right, then, has the profession to expect the faculties to inaugurate the reforms? With what justice does the profession ask the professors to sacrifice their livelihoods for a reform which can redound only to its (the profession's) good, and for which the profession will not make the slightest effort? The sacrifice must be made by some: let it be by those who gain by it. Let it be by those whose numbers will so divide it that each individual will scarcely feel his share.

There are two ways in which it is conceivable the profession could effect the desired change. That which is least practicable, because requiring greatest consentaneousness and persistency of action, would be for the profession to force, so far as lies in its power, medical pupils to go to those colleges which adopt the advanced system. Thus, if our city schools found that a third, or even a fourth, of their classes, owing to the efforts of their own alumni, were going to Harvard, it would not be long before their courses would be prolonged. In other words, let the profession make it the interest of the schools to raise their standard, and they will do it.

Another, and seemingly far more practicable, as it is more just, method of reform, is for the alumni to raise endowment funds. It is certainly directly to the interest of practitioners that the present manufacture of rivals by steam should be checked.

* * * * *

In the name of a profession which ought to be high and noble, we hope some one will make the effort, and that clamor against or about the faculties will cease in action. Let those who have talked loudest do most.—*Editorial in Philadelphia Medical Times.*

THE DENTITION OF THE KOSTROMA PEOPLE.—The Kostroma people* now being exhibited in London, independently of their hirsute appendages, are of great interest on account of the remarkable condition of their jaws.

The man, Adrian, has in the upper jaw only one tooth, apparently a lateral incisor, though Virchow describes it as a canine; whilst in the lower jaw he has four incisors, or probably three incisors and a canine; and, from their texture, these teeth are doubtless of the second dentition. The man gives no account of any milk-teeth; but it is only reasonable to suppose that those at present existing were preceded in the usual way by the deciduous teeth. The boy, Feodor, has an edentulous upper jaw, and but four (temporary) incisors in the lower jaw. These are fairly developed, and well placed as to position. * * * *

* Their portraits were given in the *DENTAL COSMOS* for January, 1874.
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The woodcuts show the jaws of Adrian and Feodor. The alveolar ridges of both jaws in the two subjects of this notice are not at all fully

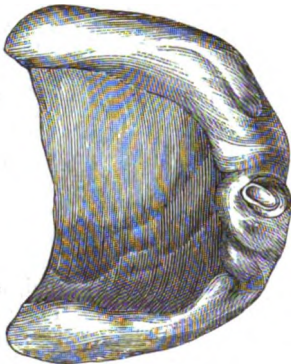


Fig. 1.—The Man's Upper Jaw.

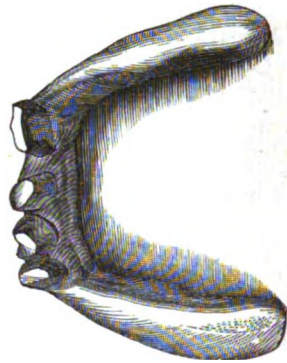


Fig. 2.—The Man's Lower Jaw.

developed, and do not convey an impression of the teeth being retained within their osseous crypts, but rather of an absence of the dental organs altogether. Taking the face in its entirety, we observe that the jaws are the only parts that have apparently been dwarfed in the process of development, the malar region being normal in character. The angle of the lower jaw has, so far as can be ascertained, retained its

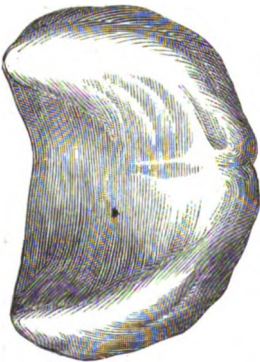


Fig. 3.—The Child's Upper Jaw.

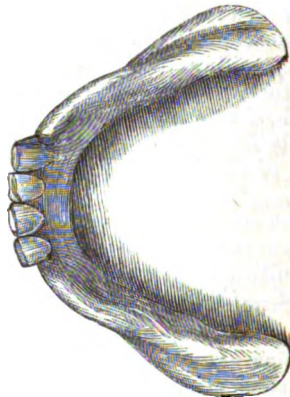


Fig. 4.—The Child's Lower Jaw.

natural form, so that, when the mouth is closed, the lower teeth, lip, and chin project in much the same way that they would do in the case of a patient who had been deprived suddenly of all the teeth with the exception of the lower incisors.

A comparison of the upper jaws of the man and the boy with one another, and with normal jaws of various known ages, in which the Museum of the Odontological Society is very rich, reveals some relations of interest. The upper jaws were selected for this purpose, as there is, unfortunately, some doubt as to the accuracy of the model of the lower jaw of the man; that of the lower jaw of the boy is certainly

accurate. The alveolar arch in Feodor's (the boy's) mouth corresponds very closely with that of a well-grown child four years of age; that is to say, it is of just the same size and shape as an alveolar arch which contains all the deciduous teeth in their places. Its posterior cornua fall short of those of children of five years, inasmuch as these latter are prolonged behind the last deciduous molar, to give space for the forming first permanent, or six-year-old molar. The alveolar arch in the man differs but slightly either in shape or size from that of the boy. Owing to its being rather less defined than that of the boy, it is difficult to measure it with the same accuracy; but it appears to exceed it very slightly in antero-posterior length, and only a little more in width. As has been already noted, this applies only to the alveolar border, and not to the whole upper maxilla. An abrupt bulging is noticeable in the upper part of the model, in the sulcus between the cheek and the alveolar border; and the malar processes are of large size, so that the face is broad and heavy.

It is, of course, unsafe to draw general conclusions from such scanty data; yet the relations existing between these two jaws seem to give some confirmation to the views as to the growth of the jaws set forth by Mr. Tomes, Sr., and subsequently confirmed by Professor Humphry, of Cambridge; for they indicate that the sole difference between the child's jaw and that of an adult is (disregarding a slight increase of width due to the greater breadth of the alveolar processes) a backward elongation of the cornua, strictly dependent on the successive addition of the posterior molars. For here is the alveolar portion of the jaw of a bulky man, the rest of whose upper maxilla is in no degree stunted, so far as we can judge, barely exceeding in size that of his child; and the explanation seems obviously to be that, as no posterior molars have been added, so no posterior elongation of the jaw has been effected. And the fact that the jaw of the boy has attained to its present size and form would seem further to indicate that the growth of the jaw up to a certain point is independent of the teeth, but that, after that point, its enlargement, which is actually little else than an elongation of its cornua backwards, is strictly and absolutely dependent on the successive additions of teeth posteriorly.

It should be added, to save misunderstanding, that the foregoing remarks apply solely to the form and size of the arch. The alveolar process, which is strictly dependent on the teeth which it carries for its depth, is in this respect necessarily deficient.—*Charles S. Tomes, M.A.; and Oakley Coles, in British Medical Journal.*

HINTS AND QUERIES.

TO THE EDITOR OF THE DENTAL COSMOS:

DEAR SIR,—In a recent issue of your journal there appeared an editorial reflecting upon the character of our proposed "History of Dentistry," followed by a protest against said publication, somewhat numerously signed.

The character and scope of the proposed work seem to have been misunderstood, and we desire to submit the following statement of facts:

After a number of months devoted to canvassing and correspondence with the dental profession, necessitating a considerable outlay of means, the publishers

became aware that the method which they had pursued was not likely to result in the cordial co-operation of the profession in the support of the work. We therefore abandoned it, and commenced anew about the 1st of January last. Former experience had enabled us to determine who were generally acknowledged as gentlemen distinguished for their scientific attainments and influence in the profession, and to that class of men we turned for advice.

Then followed an arrangement with Dr. Taft, of Cincinnati, to compile and edit the "History of American Dentistry." The selection of a limited number of names of distinguished dentists, dead and living, whose biographical sketches would properly make a part of that history, was left entirely with a committee of five gentlemen, acting in conjunction with Dr. Taft. That committee consists of Drs. John Allen, John B. Rich, Wm. H. Dwinelle, Edward Maynard, and N. W. Kingsley.

If, therefore, there is any "self-adulation" or "personal advertisement" to be found in the volume, or anything calculated to damage, instead of exalt, the profession, the responsibility will rest upon the above-named gentlemen. Such a result we do not apprehend, nor can we believe that the fair-minded men of the profession will, after this assurance, deem it probable or possible.

The publishers also fail to see how the dental profession can be "weakened in the minds of the educated members of the community" by the proposed volume, when works of like character receive the sanction and co-operation of the most highly cultivated and distinguished members of all other professions.

In conclusion, we have to say that it is our determination to make the work above all criticism, and fully acceptable to the profession at large.

Respectfully,

ATLANTIC PUBLISHING CO.

Per A. C. ROGERS, *Pres't.*

TO THE EDITOR OF THE DENTAL COSMOS:

DEAR SIR,—Your editorial in the May number of the *Cosmos* upon the proposed publication of "A History of American Dentistry and Dental Surgery," and the language of the protest published with it,—which protest attributes to the above-mentioned work characteristics and tendencies which it is not intended it should possess,—requires some response from the undersigned, who, at the request of the publishers, consented, under certain conditions, to act as a committee to supervise its publication.

The delicate and responsible duties which would devolve upon such a committee were fully discussed by us before we concluded to perform the service that was asked, and we did not fully accept the position until we were convinced that it was the earnest desire of the projectors to produce a History of American Dentistry that would be a credit to the dental profession and an honor to themselves. We required of them, as a condition of our assuming the duties of supervision, that the absolute control of certain matters connected with the production of this book should be placed in our hands. To these terms the publishers assented, and, by the power thus vested in us, we chose Dr. J. Taft, who was then one of our number, as the editor, and intrusted to him the collection and arranging of the historical matter. The selection of the individuals whose biographies should form part of this history, and the preparation and supervision of that part of the publication, is left unreservedly and absolutely with the undersigned.

That we might have all the knowledge that could be procured, to enable us to make a proper selection, we have placed ourselves in correspondence with eminent men in our profession throughout the entire country, and have, by such means, secured most valuable assistance. We have adopted, as a rule for our

selections, that only those who have been conspicuously prominent in the advancement of our profession,—either in its science, its art, or its literature,—will be available for this history; and, in this particular, we are determined that this book shall be worthy of the indorsement of all unprejudiced minds.

These are the conditions under which it is proposed to issue this "History." The publishers are abundantly able to carry out their part of the enterprise; and, with the well-known ability and devotion to the true interests of his profession which characterize the editor (Dr. Taft), and the supervision that will be given to it by this committee, what chance is there that the publication of this work would inflict the stigma of "charlatanry" on our profession, or in what way can it "offer the opportunity for men whose professional attainments are inferior, to gain notoriety at the expense of those more deserving?" We have not, as yet, finally decided whose biographies we shall select; nor have we made any report to the publishers of the result of our labors so far as we have progressed in them, and we are at a loss to know how those who drew up the "protest" referred to knew that our selections would be of the character that they protest against.

JOHN B. RICH,	} <i>Committee of Supervision.</i>
EDWARD MAYNARD,	
JOHN ALLEN,	
WM. H. DWINELLE,	
NORMAN W. KINGSLEY,	

NEW YORK, 18th May, 1874.

DOVE-TAILED CONTOUR-FILLINGS FOR INCISORS.—The old prejudice against the gold filling being in sight having worn away since the modern skilled operator leaves his work as finished and artistic as the best jewelry from the hands of the artisan, the time has now come when the most durable work must be done irrespective of the exhibition of gold.

No truly wise person will object to an entire gold crown built on the healthy root of a front tooth (the remainder of the teeth being comparatively durable) when the terrible disaster of a false tooth is the only other alternative, with all its future uncertainties and attendant inconveniences. This fact being conceded, as I know from investigation, by the best men in our profession, I would beg to explain a method in the treatment of contour-fillings in incisors where the pulps are alive, and where approximal decay has extended to the cutting edge, thus making the most treacherous operations in dentistry in regard to breaking down from the unavoidable strain that they are daily subjected to.

If the pulp is sufficiently out of our way to admit of somewhat thorough anchorage, we then do not get our anchorage where the strain is greatest, the most strain coming on the cutting edge farthest from retaining points, thus gaining leverage to more easily loosen. In making a rehearsal of the old way and its results, I am speaking from twenty years' observation among the best operators of New York City and also elsewhere. I claim to have a system which makes those operations as safe as the most fastidious can wish for. I form a dove-tail of gold extending farther on the tooth than the decay at the cutting edge, as seen in cut below, filed as best the case in hand may dictate.



I have hesitated stating this plan to the profession through the *Cosmos* until I gave it a fair trial, which I have done for the last four years; and, so far as I know, it has not been practiced by any one else, except perhaps by accident in some isolated case. I doubt its having been done even then. I can count hundreds of these corners that have been used for several years, and none have given

way after leaving the chair to my knowledge, and only one while filling up, and that, replaced next day, has remained two years intact. I have three assistants now with me on whose teeth these operations can be seen. One of my students, a graduate of the Maryland Dental College, and my former partner, a graduate at Philadelphia, both say the principle is new to them. This shaped dove-tail makes the strain of biting come on the elbow of the tooth formed by the filling, and tearing off the filling is next to impossible. I use Globe foil No. 4 cohesive, annealed before using, non-serrated pluggers, the points formed to suit the case on the stone, and the small steel mallet.

It is impossible to explain in detail the principle of preparing the tooth, as each case must call to bear the ingenuity of the operator; and a general rule would be of little use as a guide, the illustration conveying the idea better than words.—ELEAZAR PARMLY BROWN, *New York*.

UNION OF THE DENS SAPIENTIAE WITH SECOND MOLAR.—The malposition of a tooth may be highly important in a pathological sense, especially when union has taken place, and particularly when occurring in certain localities of the jaw, if removal is indicated. The books are full of cases, and the specimens are not a few, to prove the fact that any of the teeth may be united during development. As this takes place during the sacular stage, we need never look for union occurring with the enamel tissues, but always with the cemental tissues, as is always seen in specimens. The investigation, therefore, may always be directed to that part of the tooth within the alveolus with a good degree of certainty, especially where the crowns are in view. The union can usually be detected with a very fine probe; but when this is not practicable, by grasping either one of the supposed united teeth, and by a little force, the practiced eye can detect the moving of the other if united. Where malposition of the wisdom-tooth has taken place and united to the second molar within the alveolus, it is a serious lesion, and, pathologically considered, it is of vital importance.

A case in point came under my observation, January, 1874. A lady, aged forty-two years, called about the middle of January last for the removal of all the lower teeth. She was in delicate health, and stated that during the last two years she had suffered neuralgic pains about the jaws and face at intervals. At the age of thirty, according to her statement, all the teeth in the upper jaw had been removed, excepting the second superior left molar and the first and second right molars, and an artificial denture had been inserted. At the age of forty, had experienced pain when the right wisdom-tooth was being erupted; but the pain was more severe upon the left side. At times she thought something was piercing through the cheek. From the wisdom-tooth not being in place, and from the statement made by the patient, I was led to suspect an abnormal position of the dens sapientiae. There being no protuberance posterior to the molar, I was satisfied that the wisdom-tooth was buried deeply within the alveolus, and the pressure thus kept upon the nerve was the cause of the trouble so long experienced. It was therefore decided to remove the second molar. The lancet first being freely used, the tooth, with the dens sapientiae, united within the bifurcation of its roots, was removed with considerable difficulty, even after luxation. Part of the outer wall of the alveolar process was cut away to give exit from the socket, the wisdom-tooth occupying a longitudinal position in the jaw. This position is a dangerous one, the difficulty in extraction rendering fracture imminent and rupture of the large artery, which may produce fatal hemorrhage. Fortunately, in the above case the hemorrhage was easily controlled, there being no rupture of the artery. The wound was dressed

carefully, and a pledget of cotton, saturated with a solution of tannin, was gently pressed into the cavity, to remain twenty-four hours, until the vessels would be sufficiently contracted, and then removed.

I have since learned that the parts healed kindly, with no return of facial neuralgia.—JOHN S. SMITH, D.D.S., *Columbia, Pa.*

AMALGAM PLUGS AND CORROSIVE SUBLIMATE.—J. Payne, in the *Chicago Medical Journal*, has succeeded in convincing himself that thousands of people in the United States are being poisoned by corrosive sublimate, formed in the system from volatilization of mercury (in amalgam fillings) and combination with chlorine or saline substances in fluids of mouth or in food.

The dose of corrosive sublimate is from one-fourth to one grain daily. A person with ten amalgam fillings, averaging twelve grains each, would have about six pennyweights of amalgam in his mouth. Suppose he should lose by volatilization one-hundredth of a grain a day, in about forty years the whole thing would be gone; he would have taken only six pennyweights of metal if the whole of it had entered his system, or it had not combined with something else to form an entirely new substance. But the mercury does not all leave an amalgam filling, for we have all seen fillings that have been in from ten to twenty years, and could detect on a freshly-broken surface free mercury. It is true that, at the temperature of from three to four hundred, direct combination by combustion of chlorine gas and volatilized mercury may produce corrosive sublimate. It is also true that mercury volatilizes at nearly all temperatures; but does it when in combination with other metals? Or if it does, is there sufficient heat in the body to produce the combination? and is there sufficient chlorine, and is it in such an acceptable form, as to combine with the volatilized mercury? Have we any authentic basis for calculating the loss from an amalgam filling by volatilization of mercury?

Finally, this matter, it seems to me, need not take much trouble to decide, for if Dr. Payne will remove the fillings in the cases spoken of, he will find whether the symptoms spoken of were correctly attributed to corrosive sublimate or not.—M. C. S.

THE CELLULOID BASE.—I would like to congratulate the dental profession, and the public too, who are interested in the triumph of celluloid as a base for artificial teeth. I have been using it (and also most of the other bases in the market) for the last two years, and am wearing it in my own mouth. I honestly think it is superior to anything else in use. I have inserted hundreds of plates of it, and have not had a single one returned to me broken.

The material as now made is vastly superior to that which was sold at first. I had many failures when I first commenced its use, from the breaking down of the plaster models. I now make zinc models and insert them in the flask with plaster, and have not had a failure with this plan.—W. W. STARR, *Greenpoint, L. I.*

ALUMINIUM BASE.—In my article in the April number of the *DENTAL COSMOS*, on celluloid and aluminium, I omitted to say that after the casting is done in the case of the aluminium and the case removed from the mould, the aluminium pins which had been driven through the holes in the plate are to be riveted down on the upper or inside of the plate. The teeth are then securely fastened upon the plate. Celluloid may be used instead of the casting to attach the teeth to the plate, in which case the mould should be made of plaster instead of sand and plaster; or, rubber or gutta-percha may be used instead, in a plaster mould.—G. W. MATTESON, *Middleville, Mich.*

TO STEADY A DRILL.—For the benefit of those who do not use a burring engine, I will suggest a little contrivance which I have found of great value in enabling me to support and steady a drill in excavating or making retaining points. It is simply a small ring or eye formed by turning the end of any old instrument, a plugger or excavator, through which the drill may be passed, and, being held in the left hand while the drill is rotated with the right hand, will enable the operator to form the cavities of bicusps and molars from the masticating surface; to use a small drill in a large cavity, and to direct the drill to one side or another of the cavity at his pleasure. A trial of it will show in how many ways it can be made useful.—S. M.

DENTAL LITERATURE.—Adverse criticism may be somewhat unpleasant to take, but may at the same time have remedial virtues. I append some extracts from the *City Item*, a daily newspaper published in Philadelphia, which have some point.—B.

" . . . One of the marked peculiarities of the dental practitioner, the D.D.S., is the positive and emphatic manner in which he announces his views. And the younger and more inexperienced he is, the stronger does the itch for authorship make him rush into print to give his method of practice and to maintain it against all others. As he is generally not very well read up, he is apt to discover a good many things that are old, perhaps long since abandoned, and it is amusing, even to a layman, to read his pompous manner of announcing his discovery to the world. If any one doubts this, let him but glance through a few pages of the *DENTAL COSMOS*, the best publication of the kind in the country, and read the different methods of treatment upon the same subject. Take, for instance, the filling of nerve-cavities, where every conceivable substance from gold to paper and rags have been recommended, each one insisting that the material he uses to be the only one and the best. . . . Another peculiarity of the D.D.S., and one that detracts much from the dignity of an article upon the subject of scientific interest, is his fondness for adopting a jocular style mixed up with the biggest words of Latin and Greek extraction.

"If he has occasion to refer to blotting-paper, he calls it 'bibulous' paper, whilst at the same time he calls his patient a 'duck' and a 'pretty milliner.' But let him speak for himself: 'Jing-a-ling goes the bell and in comes a "duck." Not a "dead" one; but, as she divests herself of veil and water-proof and rubbers, she proves pretty as well as enterprising.'

"We submit that the above is not the proper style for a scientific article in a scientific journal, and not calculated to enhance the dignity of the dental profession."

CASE OF EMOTIONAL INSANITY.—In the periscopic department of the *DENTAL COSMOS* for April there is copied from a medical journal a squib about a dentist in Green Bay, Wisconsin, having kissed a pretty woman and making a "forced loan" of \$800 to her husband on the next day. This item has been floating in the newspapers of the country for six months past, located at one point or another, according to the fancy of the copyist. It is probable it was manufactured out of the whole cloth to begin with. But, be that as it may, so far as Wisconsin is concerned the latter part of the story kills the first; for even if any dentist here could be so impolite as to commit the offense, there is no one from whom \$800 could be borrowed by a forced loan or any other way.—WISCONSIN.

THE
DENTAL COSMOS.

VOL. XVI.

PHILADELPHIA, JULY, 1874.

No. 7.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the Office of the Librarian of Congress at Washington.]

(Continued from page 286.)

II. *Form*.—Although this predisponent to caries is by no means a necessary concomitant of the disease, it is nevertheless true that in teeth of seemingly equal resisting power otherwise, those which possess certain characteristics as to *form* are most liable to suffer. These peculiarities are such as result in deep fissures (sulci) with imperfectly-joined edges, and long and imperfectly-formed cusps, together with length and narrowness of neck.

This shape of tooth and these decided and open crevices afford that facility for lodgment of food and inspissation of mucus, and other material liable to putrescence, which would naturally seem to favor the development of incipient decay; and this, once perfectly localized, would still be just as naturally aided in every subsequent stage of progress.

Food and mucus once putrescent, the presence of fungus once established, and only the retention of these injurious agents is needed to insure most deleterious consequences.

Facts sustain fully the received theory in this connection, and it therefore becomes important that these should be recognized, and increased watchfulness be accorded teeth which present these predisponents.

III. *Position*.—It is true that we find dentures which possess the utmost beauty of alignment filled with cavities of decay, and it is equally true that we find dentures of terrible irregularity, presenting such perfect exemption from blemish as to cause much hesitation as to selection for extraction, when such operation is indicated; but, as we admit the *tendency* to decay arising from the form of the tooth, so

we have to accept the theory of increased liability to caries from position.

We find here, facility for lodgment and retention of decay-producing agents, *between teeth*, and this, together with the increased injury to enamel, done mechanically, justifies us in viewing *position* as markedly predisposing teeth to decay.

It is generally conceded that the friction of teeth of each jaw *against their antagonists*, during mastication, is rather preventive than provocative of caries, as powerful occlusion tends to more perfect removal of freshly-introduced, or somewhat acidified, remaining food, but the friction of the teeth of each jaw *against their adjoining teeth* must be detrimental in proportion to its intensity.

Thus it is that in crowded or overlapping dentures we have the fair face of the enamel abraded, and with this abrasion, that preparation of surface which favors the action of such fluids as are disintegrating to tooth-tissues, and offers increased facility for the nurture of parasitic growth.

Conclusion.—That it is impossible to accept, as sufficient explanation for cause of dental caries, any of the one-idea theories which have from time to time been so earnestly advanced and so strenuously advocated, while it is equally impossible not to award to each of them some position in a theory deemed worthy of presentation.

I have, therefore, advocated the chemico-vito-mechanical theory with its concomitant fungi.

Treatment.—The treatment of dental caries is rationally based upon the reasonably thorough appreciation which we have of its causes and method of progress, and the success which attends our efforts at meeting the indications is probably not surpassed in the treatment of any other form of disease which presents difficulties in the least degree comparable.

Cleanliness is well known to be exceedingly desirable in this direction, not only from the standpoint of comfort to one's self, but, as well, for the obtaining of a greater degree of acceptability to those with whom we are brought in contact. The improved appearance of the denture, the improved odor of breath, the absence, or at least diminution, of general or local dental sensibility, are all arguments in favor of this preventive of decay, even were it not notably an absolute necessity, as a general rule, for the preservation of the teeth; but my observation has led me to think that enlightened nations do not possess in their ordinary use (or perhaps I should say *abuse*) of the tooth-brush, nearly so good a means for arriving at this result as, possibly, the rubbing-sticks, and other means of dental cleanliness,

which are adopted by nations which we classify as merely civilized, or rank even so low as savage.

This conclusion has been reached as year after year I have had brought to my notice dentures, the appearance of which, together with the excellent condition of surrounding gum-tissue, having called forth my admiration, I have been astonished (much more so formerly than recently) to find upon questioning, that it would be hesitatingly and apologetically admitted that the teeth *were never brushed*, and that the only cleansing was a good rinsing after meals.

On the other hand, I have had scores of exquisitely sensitive, semi-denuded, discolored and decaying dentures brought to me with the self-gratulatory information that the existing unfortunate condition was not due to want of care, for the teeth and gums had been thoroughly brushed five times daily for many years, and with the best and stiffest brushes that could be obtained.

I could only draw the two inferences, that in the first class of cases good healthy conditions had been maintained with but trifling attention to cleanliness; and, in the second class of cases, that injudicious excess had so woefully overstepped the bounds of necessity, as to have produced a very great degree of harm.

That the proper use of judiciously-selected tooth-brushes is attended with most satisfactory results, is indisputable, but, as I have intimated, I have come seriously to question as to whether more harm than good is not obtained from the manner in which they are generally employed.

The brush should be selected for its moderate softness, and by no means for its stiffness; it should have rounded edges, both of bristles and handle, that neither may wound the gums; the length of time for each brushing of the teeth should never exceed from ten to twenty seconds (by the watch); the water used should never be so cold as to cause the least uneasiness to the teeth, and the articulating faces of the teeth should be even more carefully brushed than the labial or buccal. Twice, or at most, thrice brushing daily, is as often as any denture will permit, and great caution in regard to brushing the gums from off the necks, and even roots, of the teeth will have to be exercised if more than one brushing daily is indulged in.

Tooth-powders containing insoluble ingredients, such as ground barks, and especially pulverized charcoal, do nothing toward preventing decay of the teeth, and are eminently injurious by their insinuation under the margin of the gums.

For very many years it has been noticed that the use of soap as an adjunct in cleansing the teeth has proven very efficacious in the prevention of decay; this is believed to have been particularly due to the alkaline reaction of certain kinds of soap formerly used, such as mottled Castile, for example; but of late years to this has been added the

equally great, and possibly greater efficacy, of some of the most noted antiseptics, such as creasote, carbolic acid, etc., which conjoined to saponaceous compounds have wrought wonders in the retardation, and even arrestation, of caries.

Together with these, or any soaps, it is advisable to use some frictional powder, gentle or harsher, according to requirements; with some, the addition of precipitated chalk is all-sufficient to prevent the tendency to yellowish discoloration which is apt to accompany the frequent use of soap alone; but again, in other instances, it is found necessary to employ powdered cuttle-fish bone, or even finely-pulverized (levigated) pumice stone.

It has often been suggested that materials of so sharp a grit as the last-mentioned article should be used with great caution, for fear of injury to the enamel, but my experience has led me to believe this fear entirely unfounded, as many of my patients have employed it for years, with no other result than the maintenance of freedom from the unsightly green deposit which collects so rapidly upon some teeth.

When, from testing the contents of cavities of decay and the fluids of the mouth with litmus-paper, an acid condition is pronounced, great benefit will be derived from the addition of a few drops of ammonia, or a grain or two of bicarbonate of soda, to the water used for brushing the teeth, or, lime-water may be easily made by pulverizing a piece of quick-lime about the size of a walnut, and putting it into a pint bottle; add to it water, shake, allow it to settle, and it is ready for use. When nearly used, fill the bottle again with water, and with the same treatment as before it is again ready. Thus lime-water for a lifetime may easily be had.

If more than this seems indicated, I next add to the above the directions for the topical employment of precipitated chalk. This it is most advantageous to use at night, just before going to bed. It is to be used in small quantity by dipping the end of a finger into the chalk and thus conveying from three to five grains of the powder to the interstices of the lower buccal teeth.

It is then gently rubbed into these and *allowed to remain*: so little as to be unnoticed by the senses of touch and taste, and yet enough to do great good in the desired direction.

With ordinary care, and particularly with the use of soap, the morning brushing destroys most of the power for harm pertaining to all the putrescing food and mucus, and all the fungiferous growth of the previous night; the mastication and concomitant outpouring of saliva at the morning meal completes the work of protection for the time, and although the remaining food, which is left in cavities, crevices, and interstices, would, in time, become productive of caries, yet the allowed time is insufficient for the accomplishment of much injury be-

fore the mastication and insalivation of the noon-time food repeats the dislodgment of the spoiling remains, and thus again protects the denture ; again, at the evening meal the same result ensues, to which is frequently added that brushing of the teeth which forms part of the preparation for the evening. Thus it is that the teeth pass through the day and early part of the night without much progress of caries ; but, after retiring, the remaining particles of acidifying food, the inspissating mucus, the developing fungi, all combine to make the *hours toward morning pre-eminently the period of decay*. Then it is that the chalk placed between the teeth late at night, and *allowed to remain there*, comes to the rescue, and by its antacid reaction prevents, in great degree, both disintegration dependent upon acidity, and parasitic growth.

In connection with these local measures, we prescribe for the good of the teeth just that which will be productive of greatest general good—gentle or powerful tonic medication, according to systemic indications, alkaline, neutral, or (as I have before intimated) powerfully acid, as may be required ; good, nutritious food ; above all, *rest*, both physical and mental ; and the almost immediate response to treatment such as this will be alike surprising and gratifying. For a time, somewhat frequent examinations as to progress should be instituted, and the patient's attention be directed to the changes which will soon present. The ceasing of appearance of new cavities of decay should be remarked ; the absence of sensitiveness of teeth, generally and locally, should be commented upon ; the unchanged condition of edges of cavities containing fillings should be pointed out, as contradistinctive to the previous early crevicing ; and the continuance—the persevering continuance—of effort upon the part of the patient be faithfully and earnestly urged ; and, *if doubt* as to the connection between treatment and result is even slightly intimated, permit the cessation of effort for a few months, and the probability will be, that the expense attendant upon the introduction of a few new fillings, and the reparation of several old ones, will fully and finally convince both patient and practitioner that upon mutual effort depends success, and that by mutual effort everything will be gained.

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

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(Continued from page 292.)

THE MOUTH.

WE divide this section of the facial region into the *mouth proper*, and its *vestibule*.

The *mouth* is the cleft formed by the absence of union between those portions of the first (maxillary) and second (mandibular) visceral arches of the embryo as they appear within the facial region, and closed laterally by the buccinator muscles. Above, it is limited by the maxillary arch; below, by the mandibular arch. The floor of the mouth is intruded upon by the lingual apparatus. At the sides, the mouth is enclosed by the teeth and the alveolar processes. The mouth communicates with the pharynx and the vestibule.

The *vestibule* is confined within by the teeth and the alveolar processes; without, by the cheeks and lips. It joins the mouth internally through a space on either side, in front of the coronoid process and behind the last molar tooth. When the lower jaw is elevated, the mouth is separated from the vestibule, but when depressed, the vestibule and the mouth form a common chamber.

We will speak first of the *mouth*, reserving the floor of the mouth for our remarks on the tongue, and the teeth and gums to another section. We have now but to treat of the *roof*.

The limits of the *roof of the mouth* are those of the hard palate, and are defined by the upper alveolar processes and teeth in front and at the side. Behind, the limit may be said to answer to the posterior margin of the palatal bones. In the living subject, of course, this distinction between the roof and the soft palate is not apparent. Its largest diameter is transverse,—ovoidal, with the smaller extremity behind. The slope of the roof is liable to extreme variety. The antero-posterior contour is generally at first flat, viz., as it is seen directly behind the incisor teeth. Thence, it somewhat abruptly arches upward and backward, to become again nearly plane at the middle line of the horizontal plate of the palatal bone. The transverse contour at the incisorial region is nearly flat, but at the region of the molar teeth it presents abrupt lateral borders and a shallow transverse arch. The latter may, however, be pronounced or produced.

The arch is much modified by age, being shallow in edentulous conditions, and is best developed when the dental armature of the adult is complete. The median ridge seen in the roof of the mouth of most subjects is due to the downward pressure of the nasal septum.

At the point at which the incisorial portion joins the region of the horizontal plate (of both maxillary and palatal bones) there is seen a number of irregular crescentic lines, arranged with their curves directed forward in concentric rows on either side of the median line. These are termed the *rugæ*. They are the rudiments of the more extensive complement found in lower animals, with whom a distinct series is seen pertaining to the region of the incisors as distinct from the rest of the roof. It will be observed that the surface between that of the *rugæ* and the teeth is almost smooth. It is against the latter surface that the tip of the tongue rests in repose, and not withdrawn to the floor of the mouth, as is seen when the lower jaw is depressed. The lower jaw being slightly depressed, the tip of the tongue is abruptly withdrawn from the space in producing the sound of the letter *t*. The *rugæ* are of use as accessories of taste by the rasping of the tip of the tongue backward over them. The restriction of this region to that of the intermaxillary bone is significant. The region of the horizontal plate is unable to bear any but very slight pressure from below upward, except at the median ridge.

The space between the vertical alveolar borders at the side of the hard palate is occupied by the posterior palatal vessels and nerves, as that of the central incisorial region receives the anterior vessels and nerves. Hence, abscesses in the sides and anterior aspect of the roof of the mouth are more vascular than those placed toward the center.

Tumors of the roof of the mouth are rare which do not involve the floor of the nose (*q. v.*). The most frequent lesion recognized is perforation from syphilitic necrosis. Cases of fibrous tumors have been recorded, and epithelial cancer is relatively not unfrequent.

The following rare form of papillary tumor is recorded by S. Jas. A. Salter.*

In a male of fifty-seven years, six months after extraction of the first right bicuspid, a swelling on the inside of the palate appeared, extending from the inner border of the alveolus toward the vault of the palate; in one year the wart-like growth had become as large as a split chestnut, and was of a creamy-white color. It was extirpated successfully by Mr. Cock.

The *vestibule* is necessarily a narrow chamber, and when the parts are at rest can scarcely be said to be a chamber in any other sense than that of a mucous-lined space placed in advance of the true mouth. The angles of the mouth being adapted somewhat firmly to the canine teeth, we have the labial portion separated in a sense from the buccal, or cheek portion. The labial portion is again distinguished by the upper and lower *fræna*. About the position of the upper first bicuspid tooth, a second fold of membrane is seen.

* Guy's Hosp. Reports, 3d series, vol. xii., 1866, 865.

The buccal division of the vestibule determines the position of the cheek. It is defined by the *buccinator* muscle, a structure remarkable for being a member of the pharyngeal-constrictor group projected into the face, and inserted in part among the muscles of the skin-layer. It is somewhat loosely fasciculated, and permits some of the glands of the mucous membrane (the molar glands) to penetrate its fibers from within, and the buccinator nerve from without. It is covered by a distinct though delicate aponeurosis, a feature distinguishing it from any of the skin group.

The mucous lining of the vestibule is smoother in the buccal than in the labial division, due to the sparse distribution of the glands,—the latter being thickly studded with glands of the racemose type. These are abundant about both the lips, particularly the upper. They are of a rounded shape, and large enough to have the outline perceived beneath the mucous membrane. The point at which the parotid duct is received by the vestibule is about the second upper molar. The mucous membrane in the vicinity of this duct is more intimately held to the buccinator muscle than elsewhere. The veins about this point and behind it are conspicuous.

The Præ-coronoid Space.—We have ventured to name the orifice of communication between the vestibule and the true oral chamber by this name. It is the mucous surface extending between the dental arches, in front of the coronoid process, and behind the third molar tooth in either jaw. The space has been briefly indicated by others. Kohn* describes it as a broad surface of mucous membrane extending across the space between the wisdom-tooth and the anterior edge of the coronoid process, and representing the union between the mucoperiosteum (gum) and the membrane of the general oral cavity. Sappey† alludes to it as the tract by which the glandular layer of the buccal chamber joins that of the soft palate. The space is due to and continuous with the soft palate. It is remarkable for the changes occurring in its relations during the acts of depression and elevation of the lower jaw. When the mandible is elevated the space is shortened,—the portion about the lower wisdom-tooth is brought up to the level of the body of the soft palate, and the posterior end of the ridge upon the mucous membrane of the cheek tends to plug up the space from without. As the jaw is depressed, the fold disappears. This mobility is associated with a layer of loose connective tissue between the mucous membrane and the basal portion of the coronoid process which it covers. The relation between the mucous layer and the bone is somewhat analogous to that seen between the pharynx and the vertebral

* Die Syphilis der Schleimhaut, etc., 1866, 380.

† Traité d'Anatomie, ly. 40.

column. The præ-coronoid space has exact clinical value. Through it, when the teeth are clinched, as in convulsions or in tetanus, fluids can be administered by a tube which has been inserted in this space. The præ-coronoid space has certain clinical bearings of interest. Observant dentists have long been aware that an incautious application of arsenical paste to an exposed pulp of the terminal lower molar is productive oftentimes of an early and general diffused inflammation of the soft palate. This has been known to extend from the buccal around to the lingual aspect of the tooth by its cingulum of gum, thence, when the jaw is closed, to find easy access by general relaxation of the part directly to the soft palate. An experienced operator has informed us that while engaged, on one occasion, in preparing the lower wisdom-tooth prior to filling, his instrument slipped and caused a slight punctured wound of the mucous membrane of the præ-coronoid space. This apparently insignificant lesion caused in the course of a few hours a general tonsillitis and staphylitis, which terminated in suppuration. Before the abscess opened, which it did spontaneously, dyspnoea with profound prostration were announced. On the other hand, this space may be involved directly from the palate. The point where the buccal ridge of mucous membrane adjoins the space is not infrequently the site of mucous patches. When submucous infiltration of this region occurs, may not its influence upon the internal pterygoid muscle furnish a more satisfactory solution of the origin of direct trismus than we have hitherto had?

The Cheek.—This is the skin-layer marking the limits of the buccal chamber, and presents few features of value. The suffusion of arterial blood through the cheek in blushing shows how delicate is the vaso-motor apparatus of this region, a fact which may also explain the evanescent herpetic eruption seen on the cheek from dental or other irritation. The venules of the cheek often become slightly enlarged in middle life.

The Lips.—The lips are equally an adjunct to the region of expression, but inasmuch as their physiological relations are with the mouth, they have been here considered. The lips represent the inner borders of the *orbicularis oris* muscle. When this muscle is contracted, and the lips are pursed, its duty as a labial sphincter is at once recognized. At rest it is much modified from the sphincter shape by the elevators and depressors of the oral angle, as well as the buccinator muscle. In this position the lips extend from canine to canine of either jaw. While recognizing this as the main idea of their construction, we find that the agents giving general form to the lips reside in the alveolar processes and the teeth. Thus the upper lip conforms to the general outline of the incisorial alveolar process. Its curve is continuous with that of the cheek, and it projects a little in advance of

the lower, as the upper alveolar process is in advance of the lower. This is conspicuous in infants, with whom the lower jaw is less developed than in the adult, and is marked in strumous subjects. The moderate projection of a short upper lip is essential to beauty. These relations of the upper lip with the jaw are such that we are not surprised to see congenital cleft or clefts of the lip associated with a similar condition of the palate.

The upper lip is marked by a median vertical groove, the *philtrum*. The line of demarkation between the skin and mucous membrane is more sharply defined in the upper than in the lower lip.

The lower lip is much more mobile than the upper. We never by inadvertence bite the upper lip in chewing, but often the lower. It presents a fullness in the center which more or less abruptly declines toward the angles, where its line lies a little receding beneath the upper. Perhaps the most beautiful lips in the antique are those of the Venus of Milo. When viewed from in front they are cold and calm; but seen from the side, "her lips' sweet fold" is wreathed in a faint smile.

Beneath the centre of the lower lip, and limiting its mobility, is a marked depression, the mento-labial groove. When the dental arches touch, the lips touch, except that in subjects with protrusion of the lower jaw, with whom the lower lip is thrown in advance of the upper, the upper is apt to be short, and the teeth large. The mechanism of closing the mouth is here a painful process to witness, and the result, when accomplished, is, on the whole, not pleasing. Persons noted for their facial power not unfrequently have small lips. Sir Joshua Reynolds* in speaking of the actor Matthews, says, "He had no regular mouth, but spoke through a little hole in his cheek." The loss of teeth in the aged naturally increases the mobility of both lips, but particularly the lower. The upper lip sags inward, and the lower outward. When the mandible is raised, it pushes the upper lip slightly outward. An aged inmate of the Philadelphia Hospital possesses the knack of forcing the lower lip entirely over the upper, including in its ascent the tip of the nose. The protrusion of the lower lip is with some barbarous people thought a sufficiently beautiful feature to be artificially exaggerated by the insertion of pieces of wood and bone.

The labial borders of the lips, or the lips proper of common language, are of a red color in health, and of a brighter hue in children and females than in males. This coloration is due not so much to the presence of blood as to the muscular layer, which is here superficial. Luschka† affirms that the surface of the lips in children becomes dry

* Representative Actors, 110.

† Der Kopf, 1867, 305.

and of a brown color after death. It is, indeed, a sign of death of exact value.

Chapped lips consist in fissures through the epidermic lining of the lip. They are more common toward the middle of the lip than elsewhere. They are generally superficial, and of no surgical importance. Sappey* announces the hypothesis that this condition is often a predisposing cause to epithelial cancer. He finds cancer and the fissures only in the lower lip, and that in cases of cancer, a marked tendency to fissuring pre-exists for a long time.

The epithelial layer of the lip, although thin and delicate, may serve as a nidus for a distinct horny growth, as was witnessed by Dr. L. A. Sawyer.† The growth obtained a length of half an inch. Kölliker‡ has found rudimentary hairs on the labial borders.

The arteries and veins are those of the region of expression. In cases of hemorrhage from the lip (which, since it occurs chiefly from the inner side, is difficult to control), it is recommended by McClellan§ to insert a pin, as after the operation for hare-lip.

We may here note the exceedingly rich nerve-supply of the two lips. The large, tassel-like dispersements of terminal branches of sensory nerves (the infra-orbital and mental) within the small areas of the lips are without parallel in the body. The lips are thus exquisitely-endowed monitors to the alimentary canal, to say nothing of their importance in any discussion of the theme suggested by what Hyrtl terms sexual polarity.

The mobility of the lower lip, already mentioned, is in part dependent on the connection between it, the chin, and the superficial tissues of the neck. When the lip is forcibly raised, the chin becomes corrugated, showing that here is a more or less fixed point; but at the side no corrugations occur, but the platysmus layer ascends to the lip,—a small part only being inserted into the lower jaw. We will then have a line of *fixation* at the base of jaw, about the chin, and a line of *mobility* at the sides. The recognition of this fact is of great importance in plastic surgery. Dr. David Prince|| describes a fixed line which can be made after great destruction of normal structure by forming a curved incision across the neck far enough below the chin to allow pushing up of a flap from the neck, and determining the point of the desired immobility by scraping away the periosteum along the base of the jaw, so that the lower edge of the flap must adapt itself to the bone. It has also been determined that the success of a plastic operation

* *Traité d'Anatomie*, iv., 1878, 87.

† *N. Y. Jour. of Medicine*, 1851, 92.

‡ *Zeitschrift für wissenschaft. Zool.*, xi.

§ *Surgery*, 199.

|| *American Practitioner*, 1871, 225.

par glissement is at times impaired by the immobile nature of the mucous layer. It is in consequence recommended that incisions about the lips and cheeks should be made from within perpendicular to the direction of the external ones. Great stress is laid upon incision of the mucous membrane in attempts to restore the lower lip after great loss of tissue from cauterization.

Dr. G. Buck,* of New York, divides the buccal mucous membrane along the line where it leaves the lower jaw, and severs the cheek-layer as far back as the last molar tooth, and even beyond it. All the subjacent coverings are then to be dissected from the periosteum, and the detachment continued on the same level below the edge of the jaw. This permits the two edges of the destroyed area to come together.

The lip is often involved in contractions from maxillary necrosis. The affected side is drawn up. This, fortunately, is remediable, as is shown in many results of operation. See in this connection a case recorded by T. Bryant.†

(To be continued.)

A NEW ELECTRO-MAGNETIC MALLET.

BY LOUIS JACK.

(Read before the Odontographic Society of Pennsylvania, April 1st, 1874.)

FOR about three years occasional indirect attention has been called to the value and importance of the electro-magnetic mallet in the proceedings of associations and by the advertisements which have appeared in this period, but as yet, with one exception,—the excellent article by Dr. James Truman, in vol. ix. No. 2 of the *Dental Times*,—no description of this class of instruments, or explanation of their action, has appeared, and no adequate representation of their value has been made. As shown by Dr. Truman in his essay upon "The Mallet," the dynamic force of the electro-magnetic mallet exceeds all others; and as exhibited by the character of the results of those who, from continued experience in its use, have acquired the facility of easily handling it, it has become entitled to the examination of all interested in the insertion of gold fillings. The instrument is of importance, not only because it possesses the remarkable qualities of lightness of blow combined with intensity of impact, but for the further reason that, its action being automatic, the labor and strain of operations of reliable quality are diminished to both patient and operator.

The number of specific instruments of this division are very few,

* Trans. Am. Med. Assoc., 1868, 377.

† Guy's Hosp. Rep., 1862, viii., N. S., 289.

and as only one of those heretofore made public has proved to be reliable, there is little to be said of them in an historical way.

The first attempt to take advantage of electro-magnetism for this purpose, it would appear, must be credited to Mr. G. F. Green, who first produced, according to his own statements, an instrument in which he made use of the power which a heliacal coil has to draw within it towards its middle a piece of iron suspended or temporarily held at its either end. At each influx of the electrical current the suspended iron would fly to the center with quickness, to be stopped by the plugger end, arranged to meet it at that point: at this moment the current was shut off, when the mallet would fly back under the force of a spring only to return again by the recurrent opening of the circuit.

This should be designated an axial mallet.

The experiments with this class of electric pluggers have proven unsuccessful, for the reasons that the amount of electrical power required to produce any result is considerable; the action of the mallet is feeble when gravity is against the direction of movement; and when the instrument is upon its side, the friction is so considerable as to diminish the force of the shock; the movement is deficient in rapidity because of the distance through which the mallet passes, and the power declines as it approaches the center.

Mr. Green's next attempt was to attach a mallet to one pole of an armature, and oscillate this armature upon a point near one of the poles of an electro-magnet, with mechanical devices to close and open the circuit. This instrument has also proven to have no practical use, for the reasons that, on account of the mallet passing through considerable space, the blow was heavy and intense,—a combination exceedingly disagreeable,—and as the recoil was through the same distance, the blows were without rapidity,—this quality also impairs efficiency. Without an entire alteration of the mode of applying the force this specific instrument must remain obsolete.

Entirely independent of any knowledge of what Mr. Green had been doing in this direction, Dr. Bonwill, after watching the working of the armature in the magnetic telegraph, conceived, with true inventive talent, the idea to make use of this arrangement, and, with the necessary modifications and adaptations, to employ the force which impacts the style upon the paper to the delivery of the same quick blows upon the plugging-point. He therefore attached his armature by its middle upon a point at a distance relatively far from the electro-magnet, making the armature act as a mallet. Thus was secured a light and intense blow, and, as the armature moved through a small distance, gained the additional quality of rapidity; a combination of qualities of the highest importance, which rendered his instrument practically efficient. In the face of discouragements of no small character, Dr. Bonwill has from

time to time improved his first instrument, until we now have from his hands one which has proven satisfactory in most respects. To him, therefore, we are indebted for the first useful electro-magnetic mallet.

The inventions of these two gentlemen named are very distinct. Their devices are so dissimilar, the arrangement and form of their respective instruments so unlike, that each would appear to be novel; agreeing only in this, that both have taken advantage of the principle of electro-magnetic power, but have applied it by diverse mechanical devices.

Some weeks ago, in some correspondence with Dr. Bonwill, he stated he had expended his efforts upon the mallet of his invention, and would now leave the field to others. Under this stimulus I had the pleasure of maturing plans which had been forming in my mind, and made the drawings of a new instrument, possessing, as I believe, several important advantages, to which I wish to call attention.

The following is a description of this newly-invented instrument, reference being had to the drawings hereto accompanying.

The objects of this invention are to render the movements simpler and more direct than has heretofore been done; with the ends in view to produce a sharp and decided impact; to lessen the sounds of the movements at both the time of the impact and recoil; and to produce a lighter, cheaper, more convenient, and more agreeable instrument.

The principal feature of this invention consists in the form given to the electro-magnet. The core is made the segment of a cylinder, that when the helices are formed and placed together, they produce a more or less complete cylindrical body, leaving between them, at the central part, a circular aperture for the reception of a small cylinder. This cylinder receives a plunger, which imparts the force of the armature upon the plugger, and at the same time permits freedom of movement, and gives direction to the armature.

There are other improvements depending upon this one, and connected therewith, which will appear in the description, viz.:

The form of the armature and its connected parts.

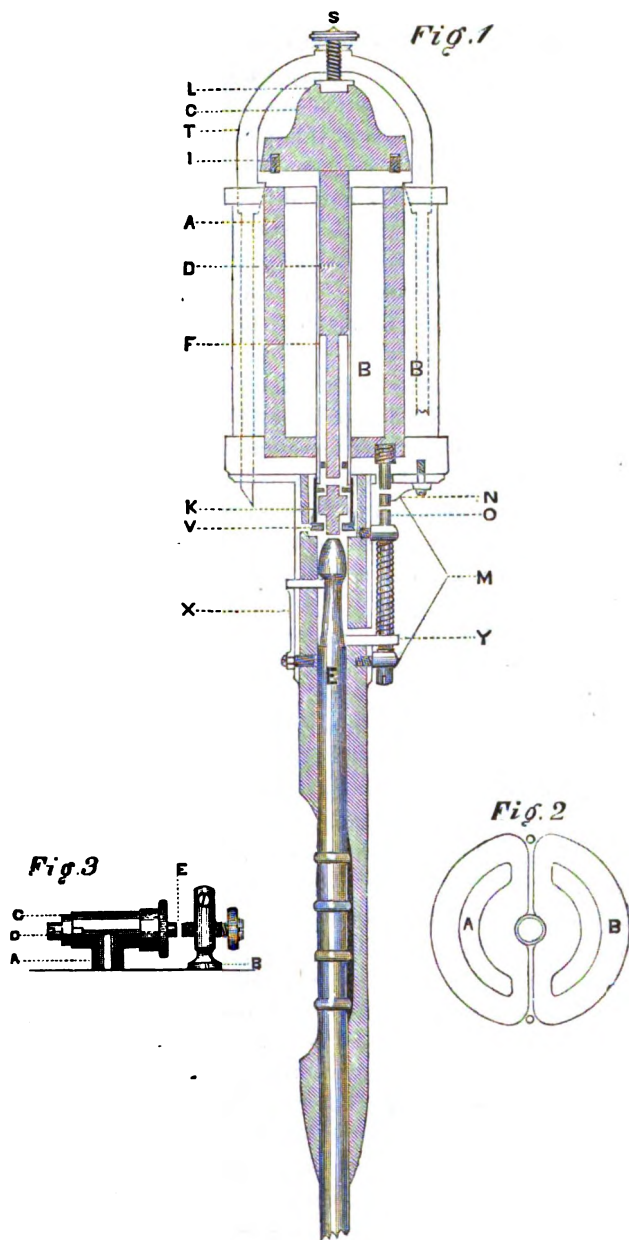
The form and arrangement of the circuit-closer.

The form and arrangement of the interrupter.

The device employed to deaden the recoil.

The means of securing the adjustments of the instrument.

Fig. 1 is an upright sectional view of the working parts of the body of the instrument. A is the soft iron core; B B, the heliacal coils; C is the armature, with its connected plunger of bell-metal, D, fitting loosely in the cylinder F; the plunger is fixed to the armature, and has a recess around it, at the lower end, to receive a spiral spring; this spring makes the recoil of the armature and plunger. The cylinder F extends the whole length of the magnet, and has a pierced diaphragm near the



NOTE.—By an error of the Engraver, the cross dimensions of Fig. 1, as shown in the cut, are only five-sixths of the correct size. Fig. 2 should be one and one-quarter inches in diameter; the measurements in other respects are correct.

bottom, as represented. The arch T invests the armature, and by its head S stops its recoil; L is a cup at the top of the armature filled with soft india-rubber to deaden the recoil; I I are screws of hard rubber, as shown; their use is to stop actual contact of the armature with the cores, and to lessen the sounds at this point.

M is the circuit-closer: it engages with its arm, at the lower end, the shoulder of the plugger E, and at the other closes the circuit by pressing the spring N upon the platina pole; when the pressure ceases, the spring upon the shaft returns the parts to their first position, and the spring N opens the circuit. The contact-pin is fitted in a recess, and rests on a spiral spring, to enable it to follow up the plugger at the moment it is driven forwards.

K, the adjuster, is one of the most important devices. It is a short tube turning on a screw-thread upon the lower end of the cylinder F; it contains a piston of hard rubber recessed at both ends to pass through the pierced diaphragm and collar; a spiral spring at the lower end maintains the proper position of the piston. The lower end is closed with a pierced cap which is furnished with holes to enable the adjuster to be raised or lowered. V is a slot through the tube to give access to the collar.

X is a spring to detain the plugger from easily escaping out of the sheath. This simple and excellent device is to be credited to Dr. Bonwill.

The hand-piece is of hard rubber. It is cut out, as shown, to receive the tip of the thumb, which is engaged in directing the plugger. The point may be flattened on one side to receive the tip of the first finger, between which and the thumb the instrument is held much as a pen is in writing. There are, however, several positions in which the instrument may be held.

Fig. 2 is a cross section of the electro-magnet and cylinder F.

Fig. 3 represents the interrupter. Its purpose is to open the circuit at the moment the impact is effected, and to retain the opening until the armature has returned to its first position. The electrical connections are made at the posts A and B; the circuit is broken at E by the wedge of the rod F driving backward the piston C by impinging against the inner end of the screw D. The rod is held in this position by friction against the screw until it is withdrawn by the return of the armature to the head of the arch, when the circuit is again closed at E. As before stated, the rod F is a prolongation of one limb of the arch. The relation of the rod to the other parts is not shown in this figure; it enters the interrupter through an opening beside the post A, the flattened side bearing upon the post while the inclined side impinges against the screw. By these means a complete mechanical pause is secured, with certainty of result and regularity of movement, however

frequent the blows may be. The adjustment is made by slightly withdrawing the contact-screw at B and the screw D; the contact-screw is then brought forward until the current freely passes, which is proven by the armature remaining down; at this step the screw D is gradually turned forward until the interruption begins. Further direction than this is unnecessary, excepting to mention that if the screw D is turned forward too much the blow will be robbed of power.

The summary of the whole action is as follows: when pressure is made upon the point of the plugger E, the circuit-closer presses the spring N upwards; this establishes the influx of the electrical current through the helices, when instantly the armature, which is held by the spring against the screw S, is brought down, strikes the piston of the adjuster, and communicates the blow to the point of the plugger; at the moment of the blow, the armature breaks the current by driving forward the rod of the interrupter as above set forth, when it is returned to its first position by the recoil-spring, and thus, in rapid succession, intense impacts are delivered so long as pressure is made at the point of the plugger.

To adjust the instrument for use, the circuit-closer should be screwed down from its contact with the spring N; the instrument is then placed upright and resting upon the point of the plugger; the armature then is pressed down, when it should be detained from touching the cores by about the thickness of thin card-board by the contact of the plunger with the piston of the adjuster. If this distance is greater or less, by moving through the slot V, the collar of the adjuster, the correction in either direction is easily made. If this distance is too great, magnetic force is lost; if too slight, the armature strikes the magnet, and fails to impact the plugger. The end of the plugger being still pressed upward against the adjuster, the circuit-closer should be screwed forward until electrical connection is made by pressing the spring N upon the platina contact-pin; this insures the blow of the plunger upon the plugger at the exact moment of closing the circuit, which is important. The best test to find the force of the impact is to hold the point upon the thumb-nail; if deficient, correction should be made by going over the adjustments.

The best results and the least discomfort of the patient are secured by careful attention to these adjustments. After a little thoughtful experiment, any intelligent person will in a few minutes master them; and when they are once made, but little alteration will be needed.

It should be noticed in this connection that the greatest economy will be found in having the batteries in clean condition, replenished to good strength, and the zinc-plates kept freely amalgamated.

The experience thus far attained would indicate that four five-inch cells of Bunsen's battery, charged in the inner cell with the "electro-

poison fluid," is the best adapted for the purpose. The batteries should be situated near the place of operating, and have the most direct connections with the instrument.

The novel claims of this invention are—the form of the magnet; the form of the armature and its connected plunger; the combined arrangement of the plunger cylinder and adjuster, whereby the force of the armature is directed upon the plugger, as set forth; the form and connection of the adjuster; the combination in the circuit-closer of the movable rod O with its arm F, the spring N, and the contact-pin, as actuated by the engagement of the arm with the shoulder of the plugger; the form and combination of the interrupter wherein the wedge-shaped end of the rod actuates the piston, and opens the circuit by pressing upon the end of the screw D at each impact; the arrangement of the arch to confine and embrace, to receive the recoil, and to regulate the degree of movement of the armature; the combination of the arch with the interrupter, as set forth.

These features are entirely new; and in their combination form a machine which is hereby given to this society, and dedicated to public use.

Having intended to present this invention, I have been careful to avoid the forms, arrangements, devices (with one exception), and manner of working of the previous instruments of this character; and believe the production is an instrument that, in every essential particular, is new.

The advantages of this instrument over those hitherto produced, in addition to convenience of handling and less weight, consist in the positiveness of the movements, the freedom from unnecessary mechanical noises, and the entire inaction, excepting exactly and instantly when an impact is wanted; there is, therefore, no avoidable annoyance to the patient, and no wastage of battery power.

To Dr. Buckingham and Dr. Woodward I am indebted for suggestions which led me to employ the recoil of the armature as a means to disengage the rod of the interrupter.

I should not stop without expressing my obligations to Mr. Otto Flemming, of this city, who has manufactured the instruments here exhibited, for his faithful adherence to the drawings submitted to him, and for his patience in accepting the modifications made during the course of construction.

I should also express the trust that this class of instruments will not be trammelled by exclusive privileges; but that the various modifications of which it is susceptible may be freely carried out without let or hindrance.

A PLEA FOR THE PERIDENTAL MEMBRANE.

BY L. C. INGERSOLL, KEOKUK, IOWA.

WE owe it to dental science to enlarge its domain, if it can be done justly, and especially if it can be done without overstepping the boundaries of any other science making a prior claim.

Authors who have written on the dental tissues describe only four different kinds of tissue belonging distinctively to the tissues of the teeth, viz., the enamel, dentine, cementum and pulp. General anatomy describes, among the membranes of the body, the periosteal membrane covering all the bones. But, as anatomy does not now class the teeth among the bones of the body, the membrane covering the roots of the teeth cannot be classed as a periosteal membrane except on the claim of the cementum to an identity with bone. Being therefore neglected in *general* anatomy, and not being classed among tooth-tissues in *dental* anatomy, it stands in science with no class-relationship to any of the tissues of the body.

My present plea is for its classification with the dental tissues.

I have chosen to adhere to the term *peridentium* in naming this membrane instead of adopting the more modern term *pericementum*, because it seems to me to conform more closely to the nomenclature of the science, and is sufficiently descriptive of its location and relation to the other tissues of the teeth.

1st. The first claim I make for this membrane as belonging to the dental tissues, is, that it shares with the pulp in the formative work of tooth-development. If the pulp belongs rightly among tooth-tissues because it is the organ of development of one of the hard tissues—the dentine—for the same reason does the peridentium, being the organ of development of another of the hard tissues—the cementum—belong to the same class of tissues.

2d. The peridentium shares with the pulp in the perpetual support of the vitality of the teeth. In fact, the vitality of the teeth is more dependent upon this membrane than upon the pulp. The pulp may be destroyed, as all dentists know, and the tooth retained in the mouth; while its retention is an utter impossibility without the vitalizing support of the peridentium.

3d. This membrane exists for no other purpose than the life and support of the teeth. When the teeth are removed this membrane is removed with them. Nature has no further purpose for it to serve. Its functions are at an end. If it were possible for it to remain in the alveolus after the extraction of a tooth, it would dissolve into effete matter and be carried off with other waste of the system.

4th. The diseases to which this membrane is subject are classed among dental diseases. If it sustains this pathological relation to the

dental tissues, why ought it not to sustain like anatomical relations? If its functions are dental, and its diseases are dental, and its existence begins and terminates with the dental organs, what possible reason can there be for not classing it with the dental tissues.

5th. My last claim is that it is a membrane so peculiar in its functions, especially in its pathological exhibitions, that it cannot be allied to or identical with the periosteum. I am aware that in this opinion I come in conflict with the theory that there is only one membrane in the alveolus—that the peridentium is identical with the alveolar periosteum. My position on this point is, that it is identical with the lining membrane of the pulp-chamber and thus holds vital relations to the pulp, and that it is not identical with the alveolar periosteum.

Its sympathetic relations would lead us by inference to this conclusion.

Inflamed conditions of the pulp often excite the same condition in the peridentium.

Again, when the peridentium is excited to renew the formative function and deposit an abnormal amount of cementum about the apices of the roots, the pulp is often excited to a similar action, and deposits like solid matter upon the walls of the pulp-chamber, or in detached granules imbedded in the substance of the pulp—or even calcifying the entire body of the pulp.

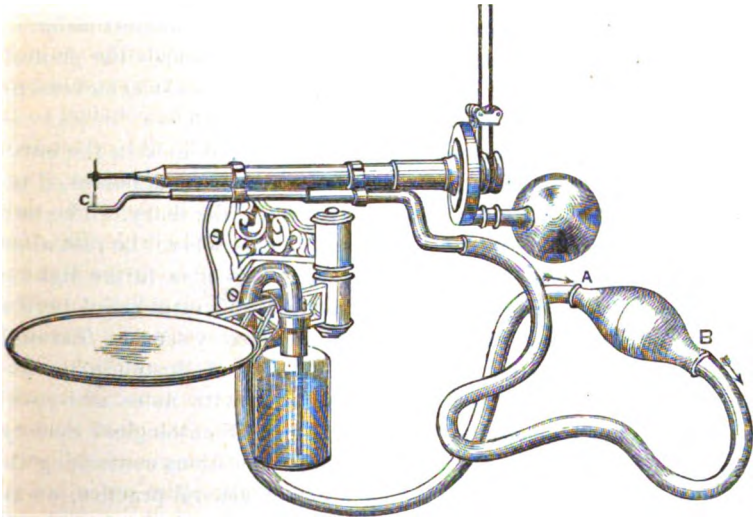
Again, in those cases of exostosis where there is considerable enlargement of the roots, if the membrane of the roots and of the alveolus was one and identical, the deposit of lime-salts would not be confined to the external surface of the roots, but the same deposit would be made on the walls of the alveolus in immediate contact with the root, causing a union of the teeth to the maxillary bone; or, in the language of those who sometimes speak without consideration or knowledge, the teeth would be “grown to the jaw.” But such a case of ankylosis cannot be produced. The reported cases will not bear the test of examination. Instead of this supposed cementitious union to the walls of the alveolus, the walls are absorbed to make room for the enlarging roots. The roots of the teeth are sometimes so much enlarged that the roots of a molar are united—the intervening septa of bone, instead of adhering to or being incorporated with the mass, is absorbed. Also, by an absorption of the transverse septa of bone separating the alveoli of different teeth, the roots of one tooth are found joined to the roots of another tooth.

If the peridentium is identical with the periosteum we should sometimes find an osseous union of the teeth with the alveoli. But such cases are not found. I therefore conclude that the peridentium is a membrane so distinct from the periosteum of bone, and so intimately related anatomically, physiologically, and pathologically, to tooth-structure, that it deserves to be classed with the dental tissues.

BUBBING-ENGINE INJECTOR.

BY PROF. GEO. T. BARKER, D.D.S.

ONE of the principal objections to the use of the burring engine, urged by patients, is that the corundum disk, rubber wheel, or bur, will become heated in consequence of its rapid revolution, and that pain will be induced in the tooth operated upon by the increased temperature. To overcome this objection, many devices have been resorted to; one, consisting in the suspension of a bottle of water above the level of the hand-piece, and, by means of a rubber tube acting as a syphon, obtain a constant flow of water upon the disk, wheel, or bur. Other operators rely upon an assistant, who injects water from a large syringe, while many use only a saturated sponge, which, upon pressure, will yield the required moisture. Recognizing that an objection to all of these methods was that they were inconvenient, and that the supply of water was with some too great, and in others too small, and was not controlled by the patient, who could best distinguish when the wheel or tooth were overheated, I have designed the little appliance, which is admirably shown in the cut, and which answers the requirements perfectly.



The apparatus consists of a small metal tube, bent at angles to fit the hand-piece of the engine (the one shown in the cut is the Elliot hand-piece), and which slides readily upon it so as to allow the fine point of exit of the water, shown in the diagram at *C*, to be directly opposite the revolving wheel. To the metal tube small rubber tubing is attached, its centre being occupied by an elastic bulb having two valves, *A* and *B*, the rubber tubing terminating in a water bottle suspended below the

level of the hand-piece. The metallic cork of the water bottle must be perforated so as to allow the air to pass into it. The rubber tubing to which the bulb is attached must terminate near the bottom of the water bottle, and should have its apex covered with a fine piece of wire gauze to prevent particles of dust, or other impurity, being carried into the metal tube, thus arresting the flow of water. When the metal tube has been adjusted on the hand-piece, the bulb is given to the patient, who is directed to gently press it when the tooth becomes heated or when directed so to do by the operator. At each pressure of the bulb a minute jet of water is projected upon the wheel, which ceases as soon as the force is relieved. When not in use, the metal tube is slipped from the hand-piece, and is suspended on the bracket above the water bottle. The appliance is dedicated to public use without any restrictions.

ARTIFICIAL CROWNS.

BY E. W. FOSTER, DENTIST, BOSTON, MASS.

THE words progressive and conservative, as applied to dentistry, are, in their highest sense, convertible terms. For that which looks to the conservation of the largest number of teeth from the simplest lesion up through the scale to the highest, is progressive towards the greatest good; and art here, as elsewhere, finds that her highest achievements are those which are wrought out in the line of nature.

The greatest lesion of continuity in the dental arch is in the entire loss of the tooth. This, happily, may become almost unapparent, if not quite so, by the latter-day triumphs of mechanical dentistry. The next in order, and the general subject of this article, is where the root alone remaining is yet amenable to preservation. This also, in the light of modern operative dentistry, may be recrowned and established permanently again in the line of continuous and satisfactory service. Through the courtesy of our friend Dr. George T. Moffat, of Boston, a method of recrowning such roots was exhibited by him, with notes and specimens, at the April meeting of the New York Odontological Society. In further elucidation, and in reply to various questions concerning the subject, its practical details, and application in general practice, we respectfully offer the remarks that follow; and these all the more freely from the open conviction that whatever or however much one may offer to the common coffer of dentistry, he can ill repay the benefits received by him from the ardent and patient workers of the past, or the brilliant contributions of the enlightened and willing workers of to-day. Our first inception and use of steel as a power in the union of crown and root dates back a few years to the case of M——, a leading tenor in an operatic troupe, who, even on the evening of a public perform-

ance, had the misfortune to break short off a gold pin of a considerable diameter that held in place a gold backed pivot-tooth; in fact, a right superior central incisor. Of course, such accidents would be hazardous to our friend in the extreme—in his position before the public as a singer, imperiling his situation, and ruining entirely his voice, and, to a sensitive nature, involving perhaps the consideration of a re-shipment to Italy!

We remember distinctly the lively and extensive language in which we were implored to make the crown *stay* this time.

On reflection, we thought we could comply with our friend's wish for a prolonged duration, and said that a pin of Stubbs's steel would continue to abide with him through this vale of tears. Steel was therefore used, and since then, we learn has been a source of joy in possession, and a comfort in security.

Among the principal features of this method is the steel screw in place of the steel pin as first applied, and which unites the crown to the root in the most perfect and absolute manner. The inner head of the screw (Fig. 1, *a*) is concave or half-globular, and completes the principle of a ball-and-socket joint between itself and the circular cavity in the posterior part of the crown, seen at *b*, in a vertical section of the same.

FIG. 1.



This, it will be observed, permits of an automatic adjustment to the root, but more so in lateral directions, a fact of great importance and convenience where the root is out of its normal position, as is frequently the case, especially as regards the anterior teeth. Where the root is sound, and the joint close, a few layers of soft gold foil are placed between the crown and the root. After a careful and final setting of the screw, an impervious joint is thereby obtained—one perfectly odorless and highly antiseptic to the root for an indefinite period of time.

The prejudice against the old and odorous varieties of crowns is well sustained by all persons of intelligence and refinement.

The front view of an incisor crown thus set is shown at *a* (Fig. 2). The posterior cavity in the crown, over the screw-head at *b*, is filled with gold or other material, and finished flush and smooth with the surface. Where gold is used, which is generally preferable, the retention of the first pellets is greatly facilitated by the previous arrangement of a few layers of adhesive gold foil under the head of the screw, whose overlapping edges serve admirably the purpose intended.

FIG. 2.



Oxychloride of zinc or gutta-percha would be indicated in cases where the root was hyper-sensitive. In the place of the layer or layers of foil in the joint, a drop of gum sandarac varnish—quite thick—will often be all that is required to accomplish the same

results. Where the end of the root is extensively decayed, the jagged interval in adjustment may be filled with gold or gutta-percha according to the judgment of the operator. The screws should be made of the best watch-steel wire, and in the main shaft do not require to be larger in diameter than a small knitting- or common-sized darning-needle. The screws may be also slightly washed in a nickel bath to suit a whim or fancy, but practically they have no advantage whatever over plain screws—for the obvious reasons of their seclusion and dryness when in position. Most of the anterior roots will, for a sufficient distance, permit the use of a drill which is three or four, or even five times the diameter of the screw. A plug of hickory in such cases is firmly set in the hole thus drilled in the root, and the end of the wood neatly finished with the outer surface. The tooth crown now firmly held in the desired position on the end of the prepared root will act as a guide in drilling for the screw—the drill passing up through the posterior cavity of the crown. Presuming, of course, that the nerve cavity is filled to the

FIG. 3.



screw with gold, a vertical half section of the root and crown with the inserted wood for the attachment of the screw would appear as in Fig. 3. At *a* appears the wood, and at *b* the external gold plug. The final attachment is facilitated by having previously run the screw once through the wood before the crown is put on. A tap for the screw is easily made from a broken excavator or other instrument of like dimensions by drawing the temper and cutting the same thread as the screw for a suitable distance upon the end. After the end is slightly rounded, three grooves, equidistant from each other, should be filed rather deeply, lengthwise of the tap, then the whole tempered and drawn back to straw color. The screws themselves will run better by being grooved likewise, but should not be tempered. However, if a tap is necessary, and a regular one is not at hand, from accident or otherwise, the screw, already grooved, needs simply to be tempered to act admirably in a double capacity.

We have spoken principally of the anterior teeth. We will now refer to this method as applied to those teeth, in either arch, that are posterior to the canines.

It will be evident from the principles involved, that bicuspid and molar crowns can be applied with the same facility, especially whenever their situation in the arch will permit the use of the drill. Bicuspids are treated in the same manner as the anterior teeth save that in the strong, broad, and frequently bifid roots of second bicuspids, two screws may attach the crown, especially where extra strength will be required from their situation in mastication.

Fig. 4 will illustrate a second upper bicuspid, in part section with two screws. Upper and lower molars will require two, three, or more

screws, as the operator may determine. Many more layers of foil will be required for molar crowns than for others in order to secure an equal perfection of their joints. Where many crowns may be called for in a case, the carver is indispensable. In cities, or in offices even, where good carvers may be had, nearly, if not every tooth may be carved by him to suit each place precisely, and little or no fitting will be required. More diversified and desirable results are thus obtained. In the country, and places too remote for such advantages, the anterior and bicuspid crowns may be furnished in various colors and shapes after the ordinary patterns. Excellent crowns of the above description have been furnished us by the enterprise and accommodation of S. S. White from moulds made expressly for such. In the matter of screws, we will merely remark that, as no town furnishes a dentist without at the same time furnishing him with a neighbor equally constant, omnipresent, and indefatigable—the jeweler—the facility of obtaining screws made to a desirable pattern will be abundant and satisfactory. Where it is decided to give the carver an opportunity to display his skill, whether it be upon one crown or a dozen, an impression in plaster will be necessary. Preceding this, all the crown-bearing roots should be prepared, dressed and drilled the same as for setting, but not tapped. Bits of wire of any kind, the diameter of the drill, are now set in each place intended for a screw, and rising to the height of the future crown. These pins should sit in their places easily enough to come away readily with the impression when it is withdrawn. The removal of the impression from about the other teeth, may be facilitated by the use of a slight portion of glycerin applied with a small camel's-hair brush about their necks and crowns. Glycerin, though agreeable of itself to most people, may be rendered quite so by perfuming it with some generally acceptable odor. The impression being now removed, is carefully varnished and oiled—the pin or pins remaining *in situ*. From this the true cast is made, the pins now being transferred to this one in turn. By careful manipulation and cutting, the pins will part with the old cast or impression with little or no difficulty. The purpose of these pins is to serve the carver for attachment of the “body” in its first moulding, and give, at the same time, the direction and diameter of the screws in the crown, the heads of which should finally occupy the position of about a sixteenth of an inch from the joint. A plaster bite of the antagonizing teeth should also accompany the final cast. If shrinkage in baking of the crown will not permit the passage of the screw freely, a small, soft steel mandril in the lathe, with the use of oil and the flour of emery, will be efficient.

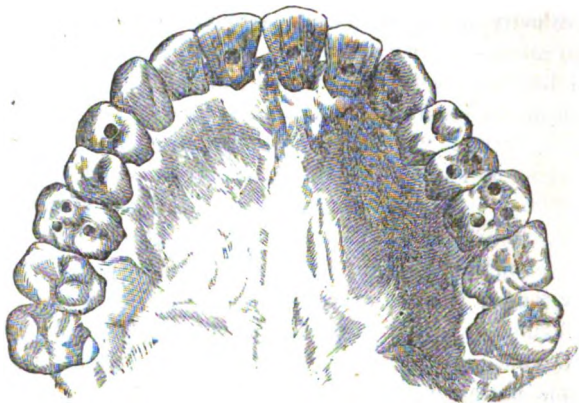
FIG. 4.



Fig. 5 represents a case where eight crowns have been set by this

method. The black dots represent the gold fillings over the screws—two in the second bicuspid, and three in each of the two molars.

FIG. 5.



In conclusion, with regard to the above method of crowning roots, and its application, we may be permitted to offer for consideration a summary of its characteristics:

- 1st. Its simplicity, neatness, and permanency.
- 2d. The impervious and antiseptic character of the union of crown and root.
- 3d. The practical application of these crowns to bicuspid and molars, as well as to the anterior teeth, which have been chiefly concerned in this matter hitherto.
- 4th. The use of the screw, which is one of the most powerful adjuncts in mechanics; and this screw of steel, uniting the minimum of size with the maximum of strength.
- 5th. The application of an entire crown of porcelain, ivory, or gold and porcelain, as set forth.
- 6th. The ball-and-socket principle of the screw-head and its cavity of reception in the crown, permitting of automatic adjustment to the root, whether in its normal position or otherwise.
- 7th. The facility with which the carver may adapt one or many crowns in either dental arch.
- 8th. The final filling and finish of gold or other material in the posterior cavity over the screw, sealing the whole imperviously, and at the same time permitting of the speedy and safe removal of the crown, when necessary from its fracture, or from other causes.
- 9th. The many objections it refutes with regard to the popular notion of "pivoting" teeth in general. Among the most prominent of which are not only the offensive odor and other imperfections of the older

forms, but the costliness and tediousness of some of the later ones, which cause frequently disastrous results from long and persistent malleting upon too often tender and devitalized roots, bringing periostitis and all the unwelcome train that follows.

10th, and lastly, one more fact, showing the power of conservative dentistry to restore many otherwise useless, crownless teeth in the domain of the first important act of digestion—mastication—to their former allotted post of ornament and usefulness.

ABOUT PEPSIN.

BY J. EDWARD LINE, D.D.S., ROCHESTER, N.Y.

[Read before the Alumni Association of the Pennsylvania College of Dental Surgery.]

PEPSIN, to which attention was first called, so far as its uses in dentistry are concerned, by Mr. J. Oakley Coles, of England, has been before the profession a sufficient length of time to warrant, if possible, a somewhat definite statement of its virtues as a dental therapeutic.

Our attention was first called to this agent by a short paragraph in the DENTAL COSMOS, and which, if we recollect rightly, was taken from the proceedings of the Odontological Society of Great Britain. Some time later there appeared in the *Missouri Dental Journal* three articles, by gentlemen of known ability, every one of which contained valuable information in a concise form. We wish here to acknowledge our indebtedness to these articles; for they are the only ones worthy of mention that have fallen under our eye. Our experiments with pepsin date from the appearance of the first of these contributions to dental literature.

We may state, by way of preface, that this substance was discovered by Schwan, and was supposed by him to be an essential constituent of gastric juice; that is, a constituent, the absence of which from gastric juice would render the digestion of albuminoid substances an impossibility. This view, which is the prevalent and perhaps only tenable one, was vigorously opposed by many, among whom may be mentioned Liebig.

Chemically, according to the analysis of Schmidt, pepsin consists of carbon, hydrogen, nitrogen and oxygen. It is precipitable by mercuric chloride, lead acetate, sodic chloride, tannic acid and alcohol.

It is classified by Wood, together with lactic acid and yeast, as a solvent; and is mentioned by the same author as "an excellent palliative in *dyspepsia*." In his remarks on gastric juice, he says that it (gastric juice) was employed years ago "with much advantage in carious and sloughing ulcers, to dissolve the dead bone and flesh. It thus not

only removed foul and irritating matter, and gave a clean surface to the ulcer, but seemed to promote the healing process by a gentle stimulation." If gastric juice could accomplish all this, then it seems reasonable to suppose that the same thing, and much more, might be brought about by the use of its catalytic element, pepsin, alone and in its greatest purity.

Inasmuch as pepsin has been known as a possible dental remedy for less than two years, and for a less time still experimentally, but few cases, favorable or otherwise to its use, have been put on record. Those which follow are contributed for whatever of information they may contain, and as an incentive to others to experiment with an agent that promises to become invaluable to him who would save, not only the merely-exposed pulp, but such as have already undergone partial disintegration.

CASE I. This case, which came under our care April 3d, 1873, was that of a young man about twenty-five years of age, in sound health, and whose teeth, with one exception, were in a remarkable state of preservation. On examination we found a very large cavity which involved the mesial and crown surfaces of the first right superior molar. Further examination brought to view an opening into the pulp chamber, large enough to admit a sixteenth of an inch burr-drill. This we enlarged to double its original size. The cornu of the pulp which corresponds to the antero-lingual angle of the tooth was absent, and the cavity it once occupied filled with the products of suppurative inflammation, together with such other matter as gained admission from without. This accumulation was removed to some extent by means of tepid water thrown from a syringe.

Our next step was to make a paste of pepsin and water. This we carried on a little ball of cotton into the cavity of the pulp, and then covered with sandarac varnish on cotton.

Next day (April 4th), we removed the contents of both cavities, and because of the limited action of the pepsin, introduced more, this time saturated with glycerin. Sealed with the same material as before.

The third day (April 5th), we removed the work of the day previous, syringed thoroughly with tepid water, and examined. We found that portion of the pulp-chamber already alluded to perfectly clean, the pulp in good condition, and not more sensitive than in cases of simple exposure.

We now filled the pulp-chamber with a thick chloroform solution of Canada balsam, covered this with a bit of paper, and introduced enough of Worff's cement to fill the cavity of decay. The only immediate result at all unfavorable was slight pain, which lasted, however, but a short time.

About three weeks later (April 25th), the gentleman called and re-

ported that the tooth had been, as a whole, tolerable; that it had pained him off and on for two or three days after his last visit; and that it now took his attention only when he happened to bite something unusually hard. We gave him some encouragement, and requested him to report again.

Seven months later (Nov. 7th), he called to complain that for about two weeks the tooth had been very sensitive to changes of temperature. On examination we found the cervical portion of the filling entirely gone; a condition not uncommon to mineral-cement fillings of whatever kind when located near the margin of the gum. We removed the remainder of the filling and *looked*, but in vain, to find the opening into the pulp-chamber. Satisfied that nothing could be determined by that means, we began to *feel* for the opening with a very fine excavator, when in it went, to the astonishment of at least the owner of the tooth. We found the pulp alive and healthy, a thin partition of bone between it and the cavity of decay, which latter had, of course, been increased in size to the extent of that part of the pulp-chamber set off by the new deposit of dentine. We removed the ragged edges of the newly-made opening, capped the pulp again, this time with an ether solution of balsam, a bit of paper, and Worff's cement.

CASE II. This case presented April 22d, 1873. The party, a married lady about twenty-eight years of age, was not in health at this time, but has since greatly improved; a condition of things undoubtedly due, in part at least, to the thorough renovation to which her mouth was at that time subjected. The tooth was the first right superior bicuspid, the pulp fully exposed, the outer cornu gone. We applied pepsin saturated with a weak solution of hydrochloric acid, covered with paper, and then introduced a gutta-percha filling.

Three days after (April 25th), we removed the above; but as the pepsin had not done its duty fully, we introduced a fresh quantity and covered it with sandarac on cotton.

Eight days after the first visit (April 30th), we washed the cavity well, found the pulp as healthy as if freshly exposed, capped with a chloroform solution of balsam and a bit of paper, and then filled the cavity of decay with Worff's cement. Slight pain followed.

About a week later (May 7th), the lady called to report that after she had left the office, April 30th, this tooth, together with the one to be mentioned hereafter, ached fearfully; in fact, so intense was the pain, that to rid herself of it she imbibed a goodly quantity of "How came you so?"—which we are happy to state had the desired effect.

On February 18th, 1874, the lady called, by request, and permitted the removal of the filling. The pulp had made little progress in dentine formation; but that about which we were most concerned, the *vitality* of the pulp, was beyond question. It gave no pain on the

removal of the filling; had the appearance of health; and responded as the normal pulp invariably does, when mechanically interfered with. We re-covered the exposed portion with the chloroform solution of balsam, this with paper, and both with Worff's cement. No pain.

CASE III. This tooth, which was in the same mouth as that last mentioned, was the second left superior bicuspid, the pulp of which was fully exposed, a large portion of it gone, and much of the pulp-chamber filled with a slate-colored deposit, the nature of which we could not determine. This case, it should have been stated, presented April 22d, 1873. After the usual preliminaries we introduced pepsin saturated with hydrochloric acid, then covered with paper and sandarac on cotton.

Three days later (April 25th), we repeated the above treatment.

April 30th we found a little of the slate-colored deposit still in place, and concluded to let it remain; covered the pulp with chloroform solution of balsam, paper, and Worff's cement. No pain of any account.

One week ago (Feb. 18th, 1874), we removed the filling, found the opening into the pulp-chamber reduced in size, the pulp alive and in the performance of its proper duties. We capped as in the first operation, with balsam, paper, and Worff's cement. No unfavorable symptoms.

Three days later (Feb. 21st), the lady reported that she had had a repetition of the trouble of ten months before. Aside from this, everything pointed to success.

In the above cases we used pepsin in water, in glycerin, and in hydrochloric acid. These preparations were invariably covered with a bit of stiff paper, to prevent the objectionable action of the solvent of the gum sandarac. In some instances we used cotton, in others sandarac on cotton, in others still gutta-percha, to retain the pepsin and paper in place. In these matters we too frequently consulted convenience. Now, when about to treat a pulp more or less of which has been set aside by the sloughing process, we make a paste of Sheffer's saccharated pepsin and hydrochloric acid, cover this first with a bit of paper, then both with wax or gutta-percha. When the pulp is in good condition, we load a bit of heavy paper with a stiff chloroform solution of Canada balsam (a method which we believe originated with Dr. C. E. Francis, of New York), and adapt it to the portion exposed. This cap we cover with Worff's cement, and let it remain until conditions are such as to admit of a metallic or other permanent filling.

We confess that we did expect to see a greater amount of bone formation in both cases II and III; and that we were disappointed must be attributed to the uniformly poor health of the patient. That the pulps continued to live and perform their functions, in the first case for seven (7) months, in the second and third for ten (10) months, is

sufficient to establish in our mind the certainty of saving a large proportion of the *partial* pulps that present from time to time for treatment.

The dentist often meets with cases in which the dentine within the crown of the tooth is destitute of its mineral elements, and of such consistency that it can be neither cut nor scraped, with any degree of satisfaction, without risk of exposure of the pulp by the removal of more tissue than is desirable. The molar teeth are found in this condition oftener, perhaps, than any other, and are generally so frail as to admit of plastic fillings only. In such cases we have found the pepsin paste to answer a good purpose. It may be necessary to use it in large quantities, and to make several applications; but the painless removal of the dead dentine is only a question of time.

If our memory serves us rightly, pepsin has been used by some in alveolar abscess. It might answer well where there is a fistulous opening; but other remedies, much more efficient and of easier application, preclude its use for this purpose.

PERIOSTITIS.

BY WM. C. WARDLAW, D.D.S., AUGUSTA, GA.

(Read before the Alumni Association of the Pennsylvania College of Dental Surgery.)

HAVING been prevented, by sickness in my family, preparing the paper I had intended upon the above subject, I venture to offer instead the following hurried report of a case of "periostitis," experienced in *propria personæ*:

I am of the sanguine temperament, have a strong constitution, am remarkably healthy, and traumatic lesions heal with great promptness in my case.

My inferior first and second molars, and my superior first molar upon the left side, are all dead teeth, each containing a large filling. The inferior teeth had been the seats of chronic abscesses, which, having imperceptibly developed, after continuing several months, spontaneously healed up two years since.

Six weeks ago, after I had been exposed to cold and dampness, the upper molar became somewhat sore and loose. This condition soon removing to the lower first molar, vibrated between them for two days, but finally settled down in the lower molar. Two days after the inception of this attack, the pain became severe, but, leaving the tooth, manifested itself in the eye, ear, and superior maxillary and malar bones. The tooth continued slightly sore to the touch, and loose; swelling began opposite the root. I resorted to scarification, hot pediluvia, tinc-

ture of aconite and iodine, lead-water and laudanum, etc., but nothing gave me permanent relief. Cold water was the best palliative; and after holding water in my mouth all of one night, I had no pain the next day, but during the following night I discovered that the third molar was too long, and sore. This is a living tooth, but has a large gold filling in the posterior approximal surface. The soreness in it gradually increased; the swelling opposite the first molar continued also to augment; the pains in the face returned with great severity, confined, however, principally to the ear, and palliated by cold water. A similar course of treatment was pursued with the third as with the first molar. The next morning the pain was intolerable, but was relieved by the deep lancing of the first molar, which, however, did not bring any pus. The pain was abated that day and night, but returned in full fury the next morning, excited seemingly by the attempt to masticate food. Lancing, and drilling to the root of the first molar was now resorted to, and a little relief was obtained. In the afternoon the posterior root was drilled into, and cold water used as demanded.

A dose of morphine gave rest that night. After this, all the symptoms gradually subsided, though the third molar continued too long, and sore for more than a week, and violent paroxysms of pain would follow the sudden occlusion of the teeth. And even after all the soreness had disappeared, pain would accompany the stretching of the jaws in yawning. There never seemed to be any swelling about the third molar, though there was considerable redness, and a degree of stiffness about the tongue.

The swelling at the first molar never was very great. The second molar did not become implicated at all.

Let us now take a diagnostic review of this case, glancing at its most striking features.

Which was the first point of lesion? The system happened to be in just that state of equipoise between health and disease requiring but a slight disturbing influence to turn the scale, and eventuate in inflammation.

A dead tooth is always a weak point, and very susceptible to irritation from external causes. Here were two vulnerable points, the first molars, upper and lower, both inviting attack. The exposure to the damp and cold was the spark to the magazine. Now, the upper molar may have been the first to receive the shock, but if so it was very soon relieved by the revulsive effect of the subsequent irritation in the lower molar. Or, the lower molar may have been the objective point, with the pain referred, through sympathy, to the upper molar. Or, both teeth may have been simultaneously attacked, the greater influence of the lower molar preponderating and swallowing up that of the upper molar. That the lower molar, however, was the point at which the trouble

began, I infer from the fact of its having become finally the seat of the disease; from its being the weaker point by reason of the abscess two years previously; from its having been refilled six months ago; from the negative argument of pain having been experienced in the eye and ear as well as in the upper molar; and from the absence of redness and swelling in the upper molar.

Sensation is always experienced in the terminal filaments of a nerve. Irritation made at any point of its course manifests itself, not at that point, but in the part to which the nerve is ultimately distributed. In this instance, the irritation was in the lower molar, but in traversing its nerve was communicated to the nerve of the upper molar, at their junction, and was thus referred to that tooth.

Thus we see pain does not appear, necessarily, at the point of trouble, nor yet make its first appearance there. Upon this principle are explained the pains in the eye, ear and superior jaw, though they seemed to have been more immediately excited in sympathy with the irritation of the third molar.

Now comes the more difficult question as to how and why was the third molar implicated? It was a case of periostitis, but what was the exciting cause? Was it an extension by continuity of the inflammation of the first molar? That could not have been, for it would necessarily have involved the second molar which intervened, and although susceptible, being a dead tooth, was not affected. The thermal shocks, from the cold water, through the gold filling, might have irritated the pulp, but then we would have had a case of pulpitis, instead of periostitis. My idea is that the periosteum was subjected to a double irritation—the thermal shock propagated through the tissue of the pulp, and an irritation sympathetic with the inflammation of the first molar.

It has been taught in the schools that sympathetic pain in a distant part is never accompanied by inflammation of that part. But does not analogy go to disprove this? We all have seen a cheek with a red blotch, and an eye bloodshot, from neuralgic pains.

The testes frequently become inflamed and swollen in association with the parotid glands in mumps. The mammae become temporarily enlarged, in supposed sympathy with the uterus, at the catamenial period. The lungs sometimes take on a vicarious hemorrhage in amenorrhœa. These are pathological and physiological instances of increased sanguineousness in parts remote from the affected parts. Is it not due to the nervous force reflected from those parts with which they sympathize? If, then, the circulation can be at all increased in this manner, it is but a question of degree between that and acute inflammation. I take it, then, that we may have the periosteum of the third molar subjected to irritation and inflammation from an active sympathy with the first molar.

Again, it is possible there may have been a general inflammation of the pulp, which, extending by continuity through the foramen, implicated the periosteum, and then retrograded. This I don't think could have been possible if there had been acute pulpitis. Then, there would have been congestion of the pulp and strangulation at the foramen, with death of the organ.

In this discussion I leave out of view the possibility of the previous death of the pulp. That would furnish a rational, and to my mind, the only satisfactory solution of the problem. The pulp was, however, alive quite recently, and so seems to be now, and I have been proceeding only upon that supposition.

The discussion of the treatment in the case would draw out this paper beyond proper limits. I would, therefore, in conclusion, propound the following questions: Was this—the third molar—a case of genuine periostitis? Was there accompanying pulpitis? Can periostitis be propagated through a living pulp, and the pulp return to a normal condition? Is a case of such violent periostitis possible without the presence of a dead pulp? Was the treatment judicious? Why did it fail to cut short the inflammation? What induced a return to normal condition?

CORRESPONDENCE.

As tending to throw a little light upon the subject of dental education in the future, I venture the following statement of facts:

In October, 1873, the Michigan State Dental Association held its meeting at Ann Arbor, the seat of Michigan University.

By a unanimous vote, a half-day was set apart in which to pay a hasty visit to said institution. The day was fine, and the walk only one-half mile from our hotels.

We approached the library building first, and stepped in and glanced at the shelves, containing about thirty thousand volumes in the aggregate. We passed through the large halls devoted to the purposes of the museum. The articles here accumulated embrace one hundred and thirty-one thousand specimens, illustrative of geology, zoölogy, and botany.

We inspected the new auditorium, then just completed—save a little paint—the seating capacity of which is three thousand. We walked through the analytical chemical laboratory. This contains tables, chemicals, and all needful apparatus for the accommodation of one hundred and twenty-five students in the personal pursuit of qualitative and quantitative analyses; and is far too limited in capacity to accommodate all who apply for instruction in this department.

At the medical building we were admitted to the reception-room,

where we were greeted by Prof. Ford (anatomy), who said in substance, that he was glad to meet us, and especially glad to see us under the circumstances. To the free interchange and comparison of individual ideas in local societies as well as in the larger conventions, is greatly to be attributed the continued advancement in the science of medicine. So comprehensive is the field already, that to become a proficient in any one of its several prominent departments requires the close attention and undivided energies of any aspirant, however apt. In early life he gave the subject of dentistry some attention. His preceptor practiced medicine and dentistry both. This was prior to the days of dental colleges. With such knowledge of the subject as he could thus acquire, he commenced the practice of dentistry. Soon, however, he began teaching anatomy, since which time he has not attempted to keep posted on the subject of dentistry. He has not even read the dental journals; but he has observed with pleasure that the earnest and faithful laborers in this department of the science of medicine have elevated the specialty to the dignity of a profession.

To these remarks, Prof. J. Taft (of the Ohio College of Dental Surgery), who was present with us, responded in substance as follows:

In behalf of the members of the Michigan State Dental Association here assembled, I thank you for your kind reception and words of encouragement. The profession, and citizens of Michigan, as well as the community at large, are deeply interested in the proper education of all who are to assume to discharge the responsibilities growing out of the legitimate practice of our specialty. The truths of the general principles of the science of medicine, and of the collateral sciences, are unchangeable. The courses pursued in the acquisition of a knowledge of these truths, in the medical and in the dental colleges, are identical. By establishing two additional professorships,—one of operative, and one of mechanical dentistry, in connection with your present course of instruction, the want of proper educational facilities in this special direction could be speedily and satisfactorily supplied. It is earnestly hoped that at no distant day such may be accomplished.

In reply to these remarks, Prof. Ford stated that no member of the medical faculty would oppose the proposition; indeed, he was convinced that each member was in favor of it, and that the only obstacle to its speedy accomplishment was a lack of funds on the part of the University.

Prof. Ford, in then conducting us through the anatomical museum, spent a considerable portion of the afternoon in calling attention to preparations especially interesting to dentists.

Prof. Douglass (chemistry) then escorted us through the apparatus-rooms, and pointed out several new, rare, and expensive pieces of philosophical and chemical apparatus.

There are now (session of 1873 and '74) eleven hundred and five students in the University. This number embraces females in each one of the several departments, aggregating about one hundred.

G. E. CORBIN, M.D.

ST. JOHN'S, MICH.

PROCEEDINGS OF DENTAL SOCIETIES.

JOINT SESSION OF THE MISSISSIPPI VALLEY AND MISSOURI STATE DENTAL SOCIETIES.

(Concluded from page 308.)

THIRD DAY.—FINAL SESSION.

The subject, "Is the Use of Arsenious Acid for the Purpose of Devitalizing the Dental Pulp still considered Justifiable and Good Practice?" was then taken up.

Dr. Rehwinkel said that it was getting so that the status of a dentist was estimated by the fact of his using arsenious acid. He was one that still used it, and does not consider it murder in the first degree, with malice aforethought.

Prof. Taft would not like to have the statement just made stand as the sentiment of the Society. Thinks mischief may be done by arsenic, and its influence on younger members of the profession is bad. In young patients it is doubtful whether it is best; in many cases it is injurious, even to the destruction of the teeth. It is a potent agent, and even in minute quantities produces death. Small quantities produce abscess and loss of the teeth. It may be days or months or years before its effects are produced. He has had no occasion for a long time to use it for devitalization; it is still worse for sensitive dentine. He saves pulps alive, and succeeds as well as before. When he destroyed pulps he did not use arsenic. In certain cases there is an idiosyncrasy against its use, and marked effects are observed from it. It is certainly safe to proceed without it. Even if a pulp is to be devitalized, can it not be by other means? There are various methods. He would not drive a wooden plug nor thrust a barbed broach into the pulp; such barbarous treatment was unnecessary. The usefulness of a tooth depends on its *life*, especially in young persons. He protests against the indiscriminate use of arsenic, or perhaps against its use at all. Prefers to remove pulp without devitalization. Anæsthetize by ether spray in front teeth; run a hook with the smooth side next the wall up the canal and cut off the pulp, and there will be only a twinge of pain; cicatrization takes place, and all goes well. When arsenic is used there is a discharge.

Dr. Rehwinkle has no patients who will endure the pain. He cannot

bring the pulp away in one piece until devitalized. Arsenic is made responsible for many things which do not belong to it; the pulp is killed by strangulation, and neglect to open the cavity is the cause of the trouble. He has yet to see the first case of trouble traceable exclusively to arsenic. At the same time he would exhaust every resource to preserve the pulp alive; but it cannot always be done, nor does he consider it criminal to kill it.

Prof. Taft regards it as much of a duty to save a pulp as to fill the cavity. If it is not healthy, make it so. Cover all the space with an agent which shall be kindly received by the pulp, will not encroach upon it, and is a non-conductor. Apply a paste of chloride of zinc and carbolic acid to the pulp and fill with oxychloride; allow to remain a few days till all is right, and fill with gold. By this plan he is as certain of saving the pulp as of saving the tooth by filling. Has applied this process for two years, even to aching pulps, with no bad results. Applies pepsin first to destroy the devitalized portion, and then carbolic paste.

Dr. Crouse devitalizes no pulp which there is a fair chance of saving. If devitalized, there is a chance for periostitis and alveolar abscess. For five years he has not destroyed one pulp where he did five hundred before that time. Does not cap with Hill's stopping nor gutta-percha; uses oxychloride. Has examined hundreds of pulps capped for five years, and found them alive and useful. We should destroy no pulp under fair conditions. In healthy cases no man is justified in destroying it. If the pulp has sloughed, get rid of it.

Dr. Morgan, in healthy subjects, caps even after sloughing with good results. Under certain circumstances uses arsenic; caps with oxychloride after bathing with creasote. The use of arsenic is productive of serious results. He has removed a portion of a maxillary which was lost from arsenious acid. In several cases has seen exfoliation of the external alveolar plate; thinks, however, it was improperly used. Two and a half hours is long enough for it to remain, especially in an active patient.

Dr. Goodrich rarely uses arsenic. Inflammation sets up after its use in one, two, or five years. Rarely makes a failure in the use of oxychloride. Does not use carbolic acid or creasote in healthy teeth. In healthy cases, pulps properly treated will not die, and he finds them vital in four or five years. Beginners need to be cautious about using arsenic. Failures in the use of oxychloride are caused by want of care in its application.

Dr. Hunter fails with oxychloride. Some claim success, and others failure. The application of oxychloride directly to the pulp will devitalize it nine times out of ten; mentioned court-plaster as a covering for the pulp. Pulps are generally inflamed when treated. Is the application of chloride of zinc dangerous to pulp-tissue?

Dr. Crouse thinks success comes from the use of creasote, by which the albumen is coagulated. Has feared bad results from oxychloride ; but now thinks it is beneficial. Does not remove all the decay over the pulp. If *scalping* was practicable, it would be often a means of success. If a tooth has been aching a week, there is small chance of success. Applies creasote to reduce size of pulp.

ELECTION OF OFFICERS, ETC.

The Mississippi Valley Association met at 12 M. for the election of officers, which was proceeded with, with the following result :

President.—Seneca B. Brown, Fort Wayne, Ind.

1st Vice-President.—Gail French, Pittsburg.

2d Vice-President.—James J. Taylor, Cincinnati.

Recording Secretary.—Frank A. Hunter, Cincinnati.

Corresponding Secretary.—A. F. Emminger, Columbus, Ohio.

Treasurer.—J. G. Cameron, Cincinnati.

Executive Committee.—H. A. Smith, Cincinnati ; H. J. McKellops, St. Louis ; W. H. Morgan, Nashville, Tenn.

The society then adjourned.

A meeting of the Missouri State Dental Association was held at 2 P.M.

A circular, addressed to the dental profession of Missouri and the Mississippi Valley, was read, stating that it is the desire of those who have the immediate charge of the Missouri Dental College to make it second to none in all its appointments. They believed the theoretical advantages of the college compare favorably with any similar institution in the land, but confessed that their appointments in the infirmary were not as extensive as would conduce to the fullest efficiency in affording daily opportunity for the students to devote themselves to the manipulative department of their specialty. They desire to supply this deficiency in a manner that will be an honor to the profession, and to accomplish this at least \$2000 must be raised by voluntary subscription. To make the burden as light as possible, two notes can be given, payable in six and twelve months from date.

Drs. Price, Rivers, and others urged upon the members to contribute to the project.

On motion of Doctor Eames, a committee of three, consisting of Drs. Rivers, McKellops, and Fisher, was appointed to solicit subscriptions.

An election for officers was then held, with the following result :

President.—Dr. C. W. Rivers.

1st Vice-President.—Dr. Griswold.

2d Vice-President.—Dr. Zepp.

Recording Secretary.—Dr. W. H. Eames.

Corresponding Secretary.—Dr. Homer Judd.

Treasurer.—Dr. J. A. Price.

Executive Committee.—Drs. Isaiah Forbes, Homer Judd, Gregory, and Kulp.

A vote of thanks was tendered to the retiring officers.

On motion, St. Louis was selected for the next session of the society, on the first Tuesday in June, 1875.

Adjourned.

ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

A meeting of the society was held at the Philadelphia Dental College on Wednesday evening, February 4th, 1874, Vice-President J. Lehman Eisenbrey, D.D.S., in the chair.

A specimen of hypertrophied cement was presented by Dr. George H. Chance, of Oregon.

Prof. S. B. Howell exhibited, by aid of the gas microscope, a number of histological specimens pertaining mainly to the dental tissues.

Adjourned.

A meeting was held at the same place on Wednesday evening, March 4th, President Dr. Thomas C. Stellwagen in the chair. Dr. E. H. Neall presented a fossilized vertebra, which had been exhumed from a marl-pit. Dr. Richard McConnell, of Canada, presented a perfect specimen of a beaver's skull. Dr. H. E. Pope, of San Francisco, presented a deciduous molar with four roots. Dr. W. H. Wright, of Washington, D.C., presented a bicuspid tooth with the foramen incomplete. Dr. R. R. Andrews, of Cambridge, Massachusetts, presented microscopical specimens showing red granules in pulp-cavities of teeth.

Prof. S. B. Howell exhibited, by means of the oxyhydrogen stereopticon, photographs of microscopical objects of great interest to the members. A resolution was passed condemning the proposed publication of a History of American dentistry, with autobiographies of practitioners.

Adjourned.

A meeting was held at the same place on Wednesday evening, April 1st, the president in the chair. A paper in reference to imperfect operations was read from Dr. H. E. Balis, of Albany. Prof. Buckingham exhibited some disks made by incorporating corundum with rubber. Dr. Louis Jack read an essay on the electric plugger, giving a general history of the instrument, and describing one of his own invention, which, by the assistance of a drawing and working instrument, he

demonstrated to those present, and closed by presenting it, through this society, to the profession.

A vote of thanks was tendered to Dr. Jack, and he was requested to furnish a copy of his paper for publication.

Adjourned.

KANSAS STATE DENTAL ASSOCIATION.

THE third annual meeting of this association was held at Topeka, on Tuesday, May 5th, 1874.

The following were elected to membership: Dr. Young, of Emporia; Dr. Lawrence, of Manhattan; and Dr. Nichols, of Salina.

Seven essays were read on important topics, and were fully discussed, especially the subject of "Dental Legislation."

A new plugger, for attachment to dental engines, the invention of Dr. Wasson, was exhibited, which gives promise of great usefulness.

The officers elected for the ensuing year are as follows:

President.—L. C. Wasson.

1st Vice-President.—A. Doud.

2d Vice-President.—A. H. Thompson.

Secretary.—J. D. Patterson.

Treasurer.—A. M. Callahan.

Corresponding Secretary.—J. B. Wheeler.

Board of Censors and Committee on Membership.—J. B. Wheeler, L. C. Wasson, J. D. Patterson.

The attendance was better than ever before, and we expect during the next two years to enlist into the society all the reputable practitioners in the State.

After being in session three days, the association adjourned to meet at Leavenworth, on the first Tuesday in May, 1875.

J. D. PATTERSON, *Secretary.*

PENNSYLVANIA STATE DENTAL SOCIETY.

THE sixth annual meeting of the Pennsylvania State Dental Society will commence at Wilkesbarre, on Tuesday, July 14th, 1874, at 10 A.M. Session to continue three days. The members of the society, and the profession in general, are earnestly requested to be present.

Essays will be read by the following members:

"Dental Nutrition," by Prof. G. T. Barker, of Philadelphia.

"Materials Used in Filling Teeth," by Prof. T. C. Stellwagen, of Philadelphia.

"Exposed Pulp and their Treatment," by H. W. Arthur, D.D.S., of Allegheny.

"Tin," by H. Gerhart, D.D.S., of Lewisburg.

"Histology," by Prof. J. H. McQuillen, of Philadelphia.

"Dental Therapeutics," by C. S. Beck, M.D., of Wilkesbarre.

A number of interesting and instructive clinics will be conducted by prominent members of the profession.

Wilkesbarre is beautifully situated in the historic Valley of Wyoming, on the North Branch of the Susquehanna, and is surrounded by immense coal beds. It is a delightful place to visit in the summer season, to spend a few days in professional and social intercourse.

Orders for excursion tickets can be had, by inclosing stamp, from the undersigned, over the Pennsylvania, Philadelphia and Erie R. R. Division to Kingston and return, and over Northern Central to Sunbury and return. Excursion tickets can be had, without orders, over the North Pennsylvania and Lehigh Valley railroads through to Wilkesbarre.

W. H. SCHOLL,
418 Franklin Street, Reading, Pa.,
Corresponding Secretary.

ONTARIO DENTAL SOCIETY.

THIS society will meet on Tuesday, July 21st, 1874, in Toronto. All American dentists who can make it convenient to be present will be cordially welcomed.

M. E. SNIDER, *Secretary.*

REPORT ON OPERATIVE DENTISTRY.

THE undersigned would be glad to receive communications in regard to any process, theory, appliance, or instrument connected with Operative Dentistry, which may be new, or has not been noticed, in the Reports to the American Dental Association of previous committees on that subject. Address

L. D. SHEPARD,
Chairman Committee on Operative Dentistry,
Hotel Boylston, Boston, Mass.

EDITORIAL.

DENTISTS AND DOCTORS.

IN our issue for June we copied from the *Philadelphia Medical Times* two editorial articles, the thoughtful consideration of which we recommended to those whom they specially concerned.

In the article entitled "Dentistry," we could wish that the author had contented himself with a discussion of the points suggested by the

topic, and had adopted a less sensational style. The "amount of angry comment" concerning his previous article on oral surgery, which, he says, was brought to his sanctum by "the little birds of whom Solomon speaks," and which astonished and amused him, must have been the result of a strictly private arrangement with those irregular and, we fear, untrustworthy messengers. With the exception of the very dispassionate remarks of the DENTAL COSMOS, we have seen no comments, angry or otherwise, on that article, and concluded that it had failed to attract the attention which its writer desired and expected. But the "little birds" have made it all right. It was necessary that a certain amount of resistance should be assumed, to justify another onslaught. The "peripheral sensitiveness" had to be discovered to warrant the diagnosis of "centric weakness." The "shoddy duke" had of necessity to be represented in a "passion," that the "real duke" might enjoy his "internal cachinnations." An unwillingness to tolerate discussion had to be taken for granted, that the reasons for the unwillingness might be explained.

The man of straw, thus set up, having been satisfactorily demolished, the information is vouchsafed (with the generous hope that "our dental friends will not be angry") that "dentistry is not looked upon at all by the medical profession as in the slightest degree co-equal with medicine, that the degree of *doctor* of dental surgery is viewed with a great deal of amusement and a little vexation;" but the assurance is given that just as soon as dentists "comply with the universally adopted rules of the medical profession, and measure up to its standard, that profession will receive them with open arms."

The value of the invitation, "Come rest in this bosom," is, however, somewhat impaired by the portraiture of the inviting party by the same artist, in the succeeding article which we copied,—"*The Annual Overflow.*" We have here an answer to the spontaneous query which arises, "Who are these in bright array," who so kindly offer, under certain easy conditions, to welcome the poor dentist to their ranks? Let the editor of the *Times* answer. A "yearly outpouring of semi-educated men," dubbed doctors because of a belief that if the parties applied to do not confer medical knighthood upon them a rival organization will; dubbed doctors, after an examination which is but "an apology to public opinion, the last act of a farce before the tragedy commences;" "a profession that sells its birth-right for a mess of pottage;" a body of men to whose ranks "a few hundred dollars and a few months' work give admission." No wonder that the writer says, "It is hard to tell whether to laugh or cry over the solemn farces of Commencement-Day."

Let us look at the relative progress of medicine and dentistry, as the *Times* itself estimates them :

"The dentist formerly acquired his art in the office of his predecessor,

and it was not considered necessary for him to study in any more extensive sphere. As time went on, and the lucrativeness of the calling attracted more and more able and cultured men, aspirations rose higher and higher; dentists began to demand a more extensive education, and the dental colleges were founded. Now another step is being attempted, and a claim is put forward for a recognition of dentistry as a medical specialty."

So much for the progress of dentistry. What of the profession which is willing, when dentists measure up to its standard, to receive them with open arms? "The influence of the profession, so far from growing stronger, really lessens with age. To-day, in circles where formerly the physician was held in high esteem, he is looked upon as a puzzle, a problem, a *lusus naturæ*." "The reasons of the declension of physicians in public esteem are no doubt manifold, but the root of all these causes seem to us to take life upon Commencement-Day. In the yearly outpouring of semi-educated men is furnished the leaven that is leavening the whole lump." "Many of the professors see, with the clearness of propinquity, the sources of evil, and sadly acknowledge the gravity of the trouble, yet they are powerless to alter or reform." "The deficiencies of our educational system are so generally admitted that they scarcely need any further illustration." "The fact is that a large proportion of the candidates really study only one year and a half, and some only one year." "The spectacle of grave critics searching assiduously for the causes of the profession's low estate, when the mud of the quagmire is upon their very persons, is most laughable." "The fault of the colleges being . . . that they do not require the student to prepare himself thoroughly before granting him a diploma."

But enough of this. "If dentistry in the abstract is worthy of a position as a medical specialty," says the *Times*, "the living, concrete dentistry can only gain such honor by a complete reorganization of the profession." Whatever in the way of reorganization it may now need, it is very certain that it will sadly need a most thorough re-reorganization when once it has *measured up to the standard* of the medical profession as portrayed by the *Times*.

The first attempt at argument in the article reviewed is a consideration of the difference between dentistry and such medical specialties as ophthalmology, in that the one "has grown up entirely outside of the medical profession, whilst the true specialties have originated and been cultivated solely inside the profession." This statement is entitled to whatever weight it deserves; but to say that because dentistry grew up outside the medical profession, it is *therefore* unworthy of recognition, is absurd. How did surgery grow up? If a man were born in a stable it would not prove he was a horse, and the *Times* has shown that the diploma of a medical college does not make a doctor.

But, says the *Times*, "every dentist announces himself as such upon his door-plate or window-sill." He had better announce himself as what he is than as what he is not, as do those "semi-educated" *doctors* after one year's study. Again, if one who had not taken a medical degree should, by the employment of the title "Doctor," and the omission of the qualifying "Dentist," fail to inform the community of his specialty, he might be censured for conveying a false impression; but those who have graduated in medicine would do well to omit it, as many do, until the code of ethics shall have been modified, as we think it should be, so as to allow a specialist to designate the limitations of his practice.

The argument which follows has force, or would have, if the premises were correct: "The dental profession is saying to the world day in and day out, by its actions, that a general medical culture is of no use, or at least is not a necessity to the dentist, whilst the specialist insists that before special studies are undertaken the candidate must have had a thorough general medical education." The point of this argument is sadly dulled when we read the character of that *thorough* education as described by the *Times*.

We are further certified that the dental colleges are an insuperable bar to the profession of dentistry ever becoming a medical specialty; that "the degree of D.D.S. is the badge of a partial culture, which must shut out from the medical ranks every one who wears no other insignia."

Here again is the game of the little joker—now you see it and now you don't. In one article the insignia is sneered at as worthless; in the next, it is made a necessity. "What was your dog worth?" inquired counsel of a Dutchman who had brought suit against another for killing the animal. "He was worth nothing," was the reply; "but since he killed him he shall pay the full value."

The *Times* thinks that dentists are *painfully* aware that the degree of D.D.S. is the badge of a partial culture, "since so soon as any one of them takes a degree in medicine the D.D.S. disappears in a twinkling from door-plate and window-shutter." Verily, the *Times* man is hard to please. He sneers at the badge of a partial culture, and sneers when the badge of a "thorough general medical education" is substituted. Indeed, throughout his several productions relative to dentistry there appears a desire to degrade rather than a generous impulse to assist in the elevation of the "calling." But let no one rebuke him. "My boy," exclaimed a deacon, "you do very wrong to fish on Sunday." "It can't be no great harm, deacon; I ain't catching nothing."

In all seriousness we advise our cotemporary to cease fretting about the status of dentistry, and devote its energies to the elevation of the "disgracefully low standard of graduation" which, it asserts, prevails in the medical colleges.

"The living concrete dentistry" is very far below what it should be, and what we hope to see it; but so far from declining in public esteem, it is steadily gaining in scientific culture and in all that entitles it to the respect and confidence of the community. Within the memory of all of us it was almost absolutely an individual and a mechanical pursuit. It now supports, in this country alone, ten colleges and six journals; has organized seventy-five associations, including national and State societies, and is governed by a code of ethics based on that of the American Medical Association. It includes a large number of those who entered its ranks before dental colleges were known, and who are painfully aware, not so much of the partial culture represented by dental colleges, as of their inability, because of the necessities of life, to obtain even the degree of D.D.S. and the amount of culture which it implies. It includes some self-laudatory men and some utter quacks. In its journals may be found many things which the more advanced are sorry to see, and too few practical and instructive contributions. In its colleges the standard of graduation is too low, but is being steadily advanced; and in its conventions and associations the problem is being earnestly discussed how to provide for a broader culture.

Whether this is to be by a reorganization of dental colleges or through facilities offered by the medical colleges, it is not the purpose of this article to discuss. The profession we would fain hope is able and ready to solve the problem in the interests of science and of humanity. The editor of the *Times* does not see the necessity for general culture in those who practice dentistry, yet the alleged lack of it is the justification for his opposition. It is just possible that unconsciously he has imbibed the spirit which of old found utterance in the complaint, "Master, we saw one casting out devils in thy name, and we forbade him, because he followeth not us."

We have no desire to indulge in controversy with the *Times*, but we cannot think the animus and spirit of its criticisms generous or becoming. We have placed its own statements as to the medical profession side by side with its animadversions on dentistry, that the one might be read in the light of the other. Not that we believe dentistry may be elevated by disparaging medicine, for whatever degrades medicine, degrades dentistry as a part of medicine. Nor do we assert that dentistry is "co-equal with medicine." It is a platitude to aver that the branch is not co-equal with the tree. In the broad sense of the term, medicine includes every specialty which proposes to deal with pathological conditions. The talk of dentistry in *comparison* to medicine is like comparing the finger to the hand, of which it is a part, and is only equalled in absurdity by the denial that it is a part. Nor will we dispute as to the relative importance of one specialty over another,—none can be unimportant.

So far as we know, it is not claimed that the "living, concrete dentistry" is entitled to be recognized as a specialty of medicine; nor that a minor degree is more than a "badge of partial culture;" but it is that, and stands for just what it is worth, and to the practitioner of dentistry is worth all it costs. And though it be the badge of a partial culture, better is thorough instruction in one branch than a smattering in all, for, though the graduate in dentistry may not have learned obstetrics, he has, we hope, learned very much as to the physiology and pathology of the mouth not even hinted at in medical colleges; and goes forth better prepared, on Commencement-Day, for his special practice, than the graduate of a medical college can hope to be for general practice.

We insist that "dentistry in the abstract" is properly a department of medicine, and that the dentist who stops short of a medical education, though thoroughly competent for the mechanical manipulations of his calling, is as deficient in the necessary qualifications for the highest practice of his vocation as the mere anatomist would be for the practice of surgery. The *Times* to the contrary notwithstanding, we assert the necessity for a general medical culture, and believe, other things being equal, the best doctor is the best dentist. We hope the time is not far distant when, dentistry being merged into medicine, all badges of a partial culture, and partial culture itself, will give place to a common culture and a common degree. But it will not be due to the efforts of one class to belittle the practice of the other.

We have presented in full to our readers the views of the *Times* on Dentistry, and have called especial attention to them. Will the *Times* reciprocate by publishing our comments?

THE ANNUAL CONVOICATIONS.

The American Dental Association will meet at Detroit on the first Tuesday in August (4th), 1874.

The American Dental Convention will meet at Saratoga Springs on the second Tuesday in August (11th), 1874.

The Southern Dental Association will meet at St. Louis on the last Tuesday in July (28th), 1874. The Southern and Laclede Hotels will make a reduction of one dollar per day from their regular rates. S. J. Cobb, D.D.S., of Nashville, has made arrangements for parties to go from Atlanta, Ga., to St. Louis for about half fare.

OBITUARY.

DR. T. B. HAMLIN.

At a meeting of the dentists of Nashville, held May 25th, the decease of Dr. T. B. Hamlin was announced, and resolutions were passed expressive of the high estimate in which he was held as a dentist and a Christian gentleman; of condolence with his family, and of the purpose to attend his funeral as a body.

PERISCOPE.

NITROUS OXIDE GAS.— . . . Dr. E. R. Squibb, in an article on Anæsthetics (read before the State Medical Society of New York, in February, 1871), says: "The condition of perfect anæsthesia is one of the most grave and frightful conditions of life, and by suspending more than half of vitality, it comes so near to death, that it is wonderful to reflect how near the boundary-line can be approached, and yet so rarely passed. The issues of life and death are narrowed to but within a few minutes. Add to this the fact that this condition rests with the physician, whether to produce it or not, and it is difficult to understand how its importance can be overestimated." This is a most fitting statement to impress the importance of our subject, and with it I invite your attention.

The obligations of an administrator of anæsthetics refer to the possession by him of a thorough knowledge of: 1st. The physiological play of those functions with which the administration of anæsthetics interferes; 2d. The *modus operandi* of each anæsthetic in the production of anæsthesia; 3d. The warning symptoms which indicate a jeopardizing of life beyond the limits of easy restoration; 4th. The conditions unfavorable to their safe administration; 5th. The means to be applied to resuscitate a patient.

The functions and physiological conditions interfered with by a state of anæsthesia are as follows, viz.: Respiration, the composition of the blood, its circulation in the capillaries, the presiding influence of the nerve centres over the several functions of the body (more especially the lungs' and heart's action), the contractility of voluntary muscle fibre, and the contraction of the walls of the cavities of the heart.

* * * * *

The progressive steps in the production of anæsthesia, as it is by poisoning the blood-supply these agents paralyze the nervous system, are as follows:

- 1st. Paralysis of the peripheral sensory nerve-fibres.
- 2d. Of the cerebral hemispheres, by which intellection is impaired and unconsciousness gradually effected.
- 3d. Of the cerebellum, by which muscular co-ordination is arrested.
- 4th. Of the spinal cord, which leads to relaxation of voluntary muscles.
- 5th. Of the medulla oblongata, which presides over the heart and lungs.

This effect is the fatal one to be avoided.

6th. The sympathetic system is affected during the progress of the above effects, but its influence does not become extinct until after all the above-mentioned nerve centres are paralyzed.

* * * * *

What to observe during anæsthesia: The play of those functions interfered with should be watched with great solicitude. We should, above all, not allow ourselves to become reckless because of our familiarity with the conditions, after repeated administrations without accident.

The respiratory movements, the pulse, the color of the skin, and of the blood flowing during an operation, the pupils of the eye, should each in turn claim the undiverted attention of him who leads his patient to the very verge of the grave. If danger threatens, the respiratory mechanism will give warning by labored and short inspirations, feeble and long expirations, laryngeal stertor, sudden stoppage of the thoracic movements. A feeble pulse, though it may beat rapidly, tells of the progressively impaired force of the capillary circulation. Arrest of the pulse may occur, dependent not upon capillary stasis, but from arrest of the heart's action, called "cardiac syncope." Chloroform is the only agent which induces this most fatal of all the dangers of anæsthesia.

The occurrence of blueness or lividity of the skin, so common when nitrous oxide is administered, as also the dark hue of any flowing blood, are omens of advancing carbonæmia, which it is our duty to restrict within certain limits. Extreme pallor (from chloroform) indicates impaired action of the heart and warns of approaching cardiac syncope. If the pupils show progressive dilatation, they tell us to admit air, as danger threatens from carbonæmia. An observation with reference to nitrous oxide, made by Dr. Amory, of Massachusetts, is most important. He tells us: "Never has an animal died unexpectedly; there is a peculiar condition produced by this gas, which, when seen, requires instant relief. Animals, at a certain stage, appear to stop all attempts at respiring, and lie motionless; if not forced to inhale air, they will die." This impresses upon us the importance to watch particularly the respiration, and not to rely too much on the pulse, in anæsthesia. It is an observed fact, that after respiration has stopped in apparent death, the heart continues to pulsate for some time before actual death supervenes.

Of the selection of patients: From what we have so far developed, we would draw the natural inference that any condition involving imperfect respiration or heart's action would contraindicate, or at least add to, the dangers of anæsthesia. Phthisis pulmonalis, cancer of the lung, intra-thoracic tumors, distension of the pleura, compressing the lung, also pleuritic adhesions, impairing their elasticity, are contraindications.

In the case of Ann O'Shaunnessy, post mortem revealed very marked and extensive pleuritic adhesions of the right lung, which was so congested with carbonized blood as to afford the appearance of the third stage of pneumonia, while the left was free from congestion. This indicated the probable cause of death, as determined by the crippled state of the right lung from the existing adhesions. The morbid conditions of the heart, which would contraindicate these

agents, are dilatations, fatty degenerations, or hypertrophy of the walls, and valvular lesions.

The above states of the respiratory organs would predispose to carbonæmia; the conditions of the heart would render the capillary circulation more susceptible to modification. Cerebral disease, with structural lesions, are cases to avoid, as this organ is rendered thereby more prone to the unbalancing of its functions.

Dangers of Anæsthesia: The dangers which we have to guard against may practically be reduced to two.

1st. Failure of respiration from progressive carbonæmia or paralysis of the nerve centre (the medulla oblongata), which presides over this function.

2d. Cardiac syncope, or arrest of heart's action (chloroform only), from paralysis of the medulla oblongata and want of oxidation of muscle-cells of cardiac walls.

In the first instance, while the breathing fails, the heart continues to pulsate. The essential feature, under these circumstances, is arrest of the pulmonary circulation of blood from distention and resultant paralysis of the right ventricle. The indication of treatment is to empty the right heart and restore the respiratory motions of the chest-walls.

In the second condition of cardiac syncope occurring from chloroform, we find that while the circulation seems to fail before respiration, the arrest of the heart's pulsation and breathing are almost simultaneous. This failure of the heart, as a primary cause of death, presents to us the most unfavorable conditions for the successful application of restoratives.

Restorative Measures, in case of the Supervention of Symptoms indicating Danger: If any of the warning symptoms enumerated above present, during the administration of either of the anæsthetics under consideration, the administrator should instantly stop the inhalation; place the patient flat upon the back, with the head a little lower than the shoulders, and admit fresh air freely; remove all the clothing from the chest; draw forward the tongue with a pair of forceps and hold it so; dash cold water over the patient's head and shoulders; give several smart slaps over the epigastric region; make pressure with alternate relaxation over the lower part of the sternum; apply ammonia to the nostrils; and introduce a piece of ice into the rectum. All this is accomplished in less time than it takes to tell it. If these measures do not prove successful in inducing respiration, one of two courses is to be pursued, according to the state of the heart. If the heart has stopped simultaneously with the breathing, the phrenic nerves are to be galvanized to induce respiration, effected by "one electrode over the phrenic nerve and the other in the 7th intercostal space," or they may be applied to both phrenic nerves. In either event artificial respiration to accompany the electrization. Artificial respiration may then be resorted to, to assist in the re-establishment of the breathing. On the other hand, if the heart still beats, artificial respiration may be resorted to before galvanism, which latter will probably not be needed, although it should always be tried in conjunction with artificial respiration, if that seems not to be sufficient. Galvanism to the heart and artificial respiration, applied jointly, excite both sides of the heart, and tend to restore the pulmonary circulation. Artificial respiration, which may

be performed either by Sylvester's or Howard's method, although the most important means to apply, must not be resorted to injudiciously. It must be remembered that, in inspiration, blood is drawn from the extra thoracic veins into the thoracic, and thence into the right auricle; while, in expiration, blood is withdrawn from the right auricle by the extra thoracic venous trunks in a reverse direction. Artificial respiration should always be commenced by expiration, in order to free the thoracic veins of blood, in the way explained, and to empty the right heart.

In cardiac syncope, galvanism of the phrenic nerves to cause the diaphragm to contract, also galvanism of the heart (the right ventricle), affords the most reliable means of resuscitation. This is accomplished by "applying the induced current at a point over the right ventricle." It must be borne in mind that, if the heart has ceased pulsating, it is impossible to restore pulmonary circulation without first rousing the heart. One more attempt may be made, viz. : a syringe introduced into a large artery may, by suction, draw out some of the blood, which may be injected back into the artery in a pulsatory or interrupted manner.

This has been found, by experiments upon animals, to revive the action of the heart even one hour and five minutes after death. There is no precedent for using this method in these cases of emergency, but it seems to me that it might be tried as a last resource.

Responsibility : The responsibilities of an administrator of an anæsthetic agent to a fellow-creature rest : 1st. In the selection of patients; 2d. In the purity of the article administered; 3d. In the method of administration; 4th. In the proper attention to the recognition of warning symptoms; 5th. In having at hand proper means for resuscitation; 6th. In the timely and efficient application of such means.

1st. From the train of thought we have so far pursued, we can deduce, as a natural conclusion, that an administrator of any anæsthetic should, to a certain extent, be responsible in the selection of his patients. If he is not a physician capable of judging as to the condition of a patient's respiratory organs, heart and brain, he should require a certificate from the patient's family physician, of fitness to take an anæsthetic. This applies more especially to the administration of nitrous oxide gas, which is almost always administered by non-graduates of medicine or dental surgery.

I conceive that a man administering this gas should be held responsible, by law, for the life of the patient, if he has not required a certificate of fitness from the patient's medical adviser, and it should be discovered by post-mortem that apparent contraindicating conditions were present. The reckless manner in which this agent is daily given in our city is but another evidence of the laxity of our laws, in protecting the community from those unqualified to administer remedial agents to the human organism.

2d. For the purity of ether and chloroform the administrator can hardly be held responsible, as their preparation requires an apparatus only possessed in large laboratories especially adapted for the purpose. At present there are certain manufacturers whose names, by long experience, have been found to be a sufficient guarantee for the purity of the articles which they furnish for the physician's use.

Not so in the instance of nitrous oxide, which is prepared by the administrator, or his assistant (!). The method of obtaining the gas

free from all impurities is, in itself, simple and well established. Attention and care will always insure its purity. I regard the administration of gas in the preparation of which any of the established rules have been neglected, as hazardous; and as such, the administrator should be responsible for its effects.

3d. In the inhalation of the several anæsthetics, the methods differ in certain particulars. With nitrous oxide, air should be entirely excluded, if prompt anæsthesia is desired. With ether the patient's throat and larynx should be accustomed to the vapor, then all air should be excluded. Not so with chloroform, which requires $96\frac{1}{2}$ per cent. of air to be mixed with the chloroform vapor. Such is the mixture as advised by Mr. Clover, the present English authority on chloroform.

If anæsthesia is necessary to be resorted to, especially if the patient's weak condition cannot bear the shock of the operation intended, it is very necessary that its full effect should be induced. It must be remembered that in a partly anæsthetized person, the anæsthetic, if it be chloroform, weakens the power of the heart, and thus the shock of the operation, if pain is felt by the patient, reacts upon the heart, producing fatal syncope more readily than without the anæsthesia. Such a result is not so liable to occur with nitrous oxide or ether; which latter agents have been shown by the sphygmograph (pulse-writer) to increase the force of the arterial and cardiac pulsations in the state of properly regulated anæsthesia.

The position of the patient is important, more especially in respect to chloroform anæsthesia. This agent should never be administered in the sitting posture, as the danger of inducing cardiac syncope is much increased thereby. With nitrous oxide and ether, that do not depress the heart, it is not so important.

4th. Above everything, an administrator of anæsthetics should be held responsible for the non-recognition of the warning symptoms above alluded to. His whole attention should be given to the state of his patient's pulse, breathing, pupils, etc. Nor should he think that those participating in the operation for which anæsthesia is induced, share this responsibility with him. He alone is the one looked to to give close attention to the influence of the agent administered. It is true that even chloroform, the most dangerous agent, has only produced one death in 2873 administrations; ether one death in 23,204; while nitrous oxide is stated to have been administered 300,000 times with but three deaths imputed to it. One of these occurred two hours after taking the gas, in a patient with advanced phthisis pulmonalis.

The other two cases are the case of Ann O'Shaunnessy, referred to in this paper, and that of a young lady who died in London since the reading of this paper. I do not think that in either of these cases the gas should be regarded as the sole cause of death, but the want of fulfillment of their obligations and responsibilities on the part of the anæsthetizers should bear no small share of the blame.

In spite of these figures, testifying as they do to the comparative safety of this class of therapeutic agents, I think that every administrator should perform his duties, in each instance, with the same care and undivided attention to his patient, as though he expected each succeeding case to be a fatal exception to the overwhelming rule of safety.

5th. We read, in a recent English monograph, that the English anæsthetizer admits his responsibility and his knowledge of the dangers incurred, in the fact that he is furnished with "stimulants—ammonia, the galvanic battery, etc., so that they may be at hand when required."

It may be said, in answer to this, that these preparations are for the admitted dangers of chloroform, but they are at times equally necessary when the safer agents are used.

Every one will admit, who has had any extensive experience with anæsthesia, that, although he may never have had a fatal case, still he has had patients present alarming symptoms, which have yielded to judicious and well-timed restoratives at hand. Every hospital or institution where anæsthetics are frequently administered should be provided with all the necessary means, in case of dangerous symptoms. The galvanic battery should be looked to from time to time, to see that it is in order. It is the administrator who should be responsible that such necessary means are present if required. It implies negligence when, in the history of a fatal case of anæsthesia, we read something like the following: "Not having a galvanic battery, it was not applied;" or, "The galvanic battery was used, but it was discovered that it would not work; another battery was sent for, but before it arrived the patient died." So valuable is galvanism in threatened death during the state under consideration, that I think it indeed culpable to find one's self without an agent forethought might have provided. Its application might save a life which we voluntarily put in jeopardy; yet we carelessly and thoughtlessly fail to provide the means of safety which that jeopardizing demands.

6th. Again, every anæsthetizer should know the methods of inducing artificial respiration, not theoretically, but he should have a practical familiarity with the necessary manipulations. He should also know how to apply electricity to the phrenic nerves and right heart.

The proper means of resuscitation at hand, their timely and efficient application is none the less a responsibility. No time is to be lost; life hangs on what is done in two or three revolutions of the second hand. A mistake or omission will be fatal, while coolness and deliberate action, that comes from the mastery of the position by knowledge, will save life.

In presenting this paper, I do not desire to invite the attacks of those who fire off their invective squibs in the columns of our daily papers, to attract the notice of an easily imposed upon community. My sole object will be attained if I succeed in intimidating some of the many who administer anæsthetics, especially nitrous oxide gas. Ignorant alike of obligations and responsibilities, these men quiet their consciences with the reflection that so many have taken it without bad consequences. Had I the power to make and enforce law, I would make a law forbidding the administration of any anæsthetic, except by or in the presence of a regularly graduated doctor of medicine or dental surgeon. The majority of those who are to-day giving nitrous oxide, are mere amateurs (if such a term can be applied), who understand but little of the practice and less of the theory of anæsthesia. They are, therefore, totally unfitted to apply agents to the human body which, even in their safest methods of administration, jeopardize human life by interfering with its most vital functions. — *Prof. Faneuil D. Weisse, M.D., in Sanitarian.*

NECROSIS OF BONE.—The frequency of this affection may be readily explained, according to Prof. Heincke, of Erlangen, by the fact that bone derives its blood-supply only from the vessels of the periosteum and the medulla, and that the vessels supplying the medulla first pass through the bone. Any disturbance of the nutrition and of the circulation in the periosteum and marrow must thus exercise very great influence on the nutrition of bone. Necrosis would not be met with so frequently if bone, like the soft parts, were capable of undergoing molecular degeneration. As this is not the case, many morbid processes, which in soft parts result in suppuration or granulo-fatty degeneration of the tissue-elements, lead in bone to necrosis. The anatomical difference between spongy and compact bone, such as the greater supply of anastomosing blood-vessels in the former, and also the abundance and the regular distribution of the medulla, render it intelligible why necrosis occurs more frequently in the latter than in the former. There are many causes which alter the nutrition of bone to such an extent as to give rise to necrosis.

In the first place, injuries of bone not unfrequently result in necrosis, the injured portion being killed either through separation from the rest of the bone or through failure of the periosteum and the medulla to supply nutriment to the osseous tissue. Professor Heincke holds, however, that even completely-detached osseous fragments do not always die, but that they sometimes form sound union with the callus thrown out at the seat of fracture. Severe contusion and concussion of bone without fracture cause laceration of the vessels passing from the periosteum to the bone and those supplying the marrow, and result in effusion of blood under the periosteum and sanguineous infiltration of portions of medulla. When these effusions are speedily absorbed, so that the periosteum becomes again applied to the bone, and the circulation in the marrow is renewed, the bone continues to live; but when, on the other hand, the effused blood sets up suppuration, the periosteum remains detached, the medulla breaks down and is destroyed, and necrosis consequently results.

Necrosis is frequently caused by inflammation, acute or chronic, which causes a persistent separation of the periosteum or degeneration of the medulla, or both these combined simultaneously. Acute osteo-myelitis rarely terminates without necrosis, usually involving the greater part, but never the whole, of the affected bone. The whole of the diaphysis of a long bone is seldom necrosed, and it is an extremely rare event for both, or even one, of the epiphyses to die together with the shaft. Chronic inflammation, resulting in necrosis, frequently occurs in scrofulous, badly-nourished, and anæmic children, and the exciting causes of such inflammation are, in most instances, chills and slight mechanical lesions. Constitutional syphilis often gives rise to chronic inflammation of bone and marrow; and finally, under the influence of phosphorus-vapor, chronic periostitis and consequent necrosis may be produced in the jaws. Necrosis from acute inflammation may occur after injury, after a surgical operation involving a bone, after chilling, and during convalescence from continued fever or some acute exanthem. A very severe form of acute periostitis and osteo-myelitis is sometimes met with, in which several bones are simultaneously affected, the general disturbance being very great and giving rise to typhoid symptoms. This affection has some resemblance to acute rheumatism, especially as it is sometimes associated with endocarditis and

pericarditis. It has been called articular typhus, osseous rheumatism, and by Roser pseudo-rheumatic inflammation of bone.

A third, but not very frequent, cause of necrosis is vascular plugging. In consequence of impairment or destruction of the circulation, primary coagulation may take place in the nutrient vessels of a bone; or the trunk or one of its larger branches may become plugged by an embolic clot. The latter is of rare occurrence. One case of undoubted embolism of an artery to bone after endocarditis has been recorded by Volkmann. Primary thromboses in the vessels of bone probably underlie, Professor Heincke thinks, those necroses which are sometimes observed in extremely debilitated subjects and in convalescents from typhoid. The coagulation is due to weakened heart's action and diminished blood-supply; it probably commences in the capillaries and small veins of the affected bone, and then rapidly extends on the one hand to the larger veins, and on the other to the arteries. The course of the necrosis in such a case is generally very rapid, the whole bone, or a considerable portion of it, dying at once, and, in cases where death does not result, speedily becoming detached from the living parts.

The upper surface of a superficial sequestrum is usually quite smooth, and resembles the surface of a portion of macerated bone; but in some cases of syphilitic necrosis and necrosis of the jaws from the effects of phosphorus, the surface of the sequestrum is covered by osteophytic deposits, which in the former affections are delicate and like grains of sand, and in the latter form large, rounded masses of bone. In those cases of osteophytic deposits the death of bone has been preceded by an inflammatory process causing periostitic deposit in addition to osseous sclerosis. Putrefaction does not as a rule take place in sequestra, as the soft structures contained in the canals of bone and in the medullary centers commonly undergo purulent and caseous degeneration before the admission of air, and purulent and caseous deposits in a wound do not readily putrefy. In some conditions, however, putrefaction does extend from the ordinary secretion of a wound or ulcer to the ichorous and caseous masses, filling the cavities of a portion of dead bone. This occurs most frequently in caseous sequestra, and in portions of bone detached in compound comminuted fracture. The parts immediately surrounding an unremoved sequestrum are pus and granulations. According to the amount of irritation, the sequestrum is surrounded sometimes more by pus, at other times more by granulations. Pus does not exert any influence on dead bone, and a sequestrum may remain a long time surrounded by purulent fluid without undergoing any change. Granulations, on the other hand, cause wasting through pressure, and probably through the dissolvent action of the secreted fluid on the lime-salts of bone. The process of melting in masses of dead bone in contact with granulations, unfortunately, goes on so slowly that no important results can thus be obtained. Through the gradual solution of osseous trabeculae lying between dilated pores, portions of sequestrum may wholly disappear; yet it seldom happens that any noteworthy diminution of a large sequestrum may be thus affected. Small sequestra may, under favorable circumstances, be thus destroyed by granulations; but sequestra of any considerable size cannot be removed by their action.

The proper time for the surgical removal of a sequestrum lies between the period of the complete detachment of the same from living bone and that at which serious affections, such as Bright's disease and

lardaceous degeneration of the abdominal viscera, make their appearance. The separation of a sequestrum from the living portions of bone does not, according to general experience, take a longer period than six months; hence the practical rule that, even in cases where the sequestrum is not movable, an attempt should be made to extract it if the necrosis commenced at least six months before. The author recommends that, where the sequestral capsule or case of new bone is very thick and its cavity very large, the whole of one wall of this capsule be removed. By this proceeding, the healing of the wound after extraction of the sequestrum is much accelerated.—*American Journal of Medical Sciences.*

EXTRA COHESIVE FOIL.—I propose in the present paper to reply to the objections raised to the use of cohesive gold foil in the February and March numbers of the *Dental Journal* by Mr. Fletcher, F.C.S., and Mr. George Ross, L.D.S. To both these gentlemen I would ask the question, Do they feel themselves in such a position as to say that they fully understand how to use and take advantage of extra cohesive foil? and if so, are they prepared to state that a perfect plug cannot be made with it? I take the Globe foil (extra cohesive foil), because up to this time it is the most cohesive foil I have tried, and of course, if there are objections to cohesive foil, they must apply to this as much, if not more, than to any other description of cohesive foil.

The articles in the *Dental Journal* I have referred to are three in number, two by Mr. Fletcher and one by Mr. Ross, and the whole sum and substance of the three articles amount to this—that it is impossible to make a moisture-tight plug with cohesive foil.

Now, before proceeding further, I wish it to be distinctly understood that I do not for one instant wish to run down plugs made on the non-cohesive or semi-cohesive principle.

Wherever it is possible to put a non-cohesive plug in a tooth in a satisfactory manner, do so by all means; it will save your patient much discomfort in keeping the mouth open long; it will save the dental surgeon much time; and I am perfectly satisfied that the plug will last just as long as if put in cohesively, although, at the same time, it will be impossible to put so high a finish on your work, or for the work to retain its finish so long.

But here is the difficulty: supposing you have such a cavity that it is impossible to fill non-cohesively, what is to be done? Either fill it with amalgam, or else fill it cohesively with gold.

Now, my view of the matter is therefore not so much a question of the goodness and fitness of non-cohesive as against cohesive foil, as between the relative qualities of cohesive gold and any amalgam that can be made. Mr. Ross, after taking much trouble to show that he thinks matured experience can only be gained by constantly working in one groove, and that there can be no doubt about non-cohesive gold being better than cohesive, finishes his paper thus:

“Nevertheless, I would say, if you had acquired any experience in soft foil in these positions, *go on with it*; but if, on the contrary, you have experienced any *difficulty*, I would say, for *very small* cavities in the front teeth, when on account of the smallness of the cavity *any amount of time and care* can be bestowed on the plug, try that which I have denounced for large cavities as no better than amalgam—viz., cohesive gold.”

Here I think Mr. Ross fails in his argument. After denouncing cohesive foil in an unsparing manner, he recommends dentists to try it for very small cavities, unless they have acquired experience (success, I suppose, would be out of the question) in non-cohesive foil. More than this, he seems to me to admit that where sufficient time and care can be bestowed on a cohesive plug, it may answer as well as an amalgam one.

Here Mr. Ross and myself to a certain extent agree that it is not so much a matter of cohesive *versus* non-cohesive gold, as of cohesive gold *versus* amalgam. But more than this, if from some quality which Messrs. Fletcher and Ross understand, it is impossible to make a plug moisture-tight with cohesive gold, how is it that Mr. Ross recommends it for very small cavities? To me the recommendation appears rather inconsistent, unless the matter is summed up thus:

Mr. Ross believes in non-cohesive plugs. Mr. Ross says that cohesive plugs are no better than amalgam, *ergo*, when a cavity presents itself to an operator that it is impossible to fill with non-cohesive foil, fill it with cohesive, or that which is quite as good, amalgam. But then, if he meant this, why did he not say so? I should not have written one word of this if the only readers of the *Dental Review* were practicing dental surgeons. My own belief is that in nine cases out of ten they, like Mr. Ross, will be opposed to change.

But there are dental surgeons that be, and dental surgeons that are to be, and to these latter I would say: Since 1863 I have been working hard at gold plugs, and trying every mode, and I am just beginning to know how to use extra cohesive gold successfully, and how fully to take advantage of its properties, thus making a plug in places where non-cohesive gold cannot be used—a better plug than can be made with amalgam, more moisture-tight, and producing far less discoloration of the tooth.

One word more and I have done. There is no reason that I know of why a large cohesive plug should not be made anywhere where a non-cohesive one is made, save this, that it takes four or five times the time, and far more skill; but at the same time I would recommend no one to use cohesive foil for such a cavity as can be thoroughly, perfectly, and densely packed with non-cohesive or soft foil, although if he likes to fill the tooth below the margin of the cavity with non-cohesive foil, and then put a facing of extra cohesive foil on the surface, he will get, and the surface will keep, a better finish than can be obtained in any other way. At all events, I do not think that I could put a cohesive gold plug in one of Mr. Fletcher's glass tubes (that is to say, a moisture-tight one), for my opinion is that before I had one quarter finished my plug, Mr. Fletcher's glass tube would have become glass dust, seeing that, unlike the working of non-cohesive foil, the walls are packed first, and the centre as the walls grow up or down.—*Gascoigne Palmer, L.D.S., in Monthly Review of Dental Surgery.*

SPECIALTIES.—Science itself is becoming, of late, the most striking example of that doctrine of growth and development which it teaches. Specialties are becoming more numerous in our schools and colleges than in our industrial establishments, and their development in all branches of human activity cannot fail to draw men more closely together in one common family, as each one becomes more dependent on the other.—*Public Ledger.*

THE DENTAL COSMOS.

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No. 8.

ORIGINAL COMMUNICATIONS.

THE FACIAL REGION.

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(Continued from page 348.)

THE REGION OF THE TONGUE.

THIS region is divided into (1) the *tongue*, and (2) the *alveo-lingual groove*.

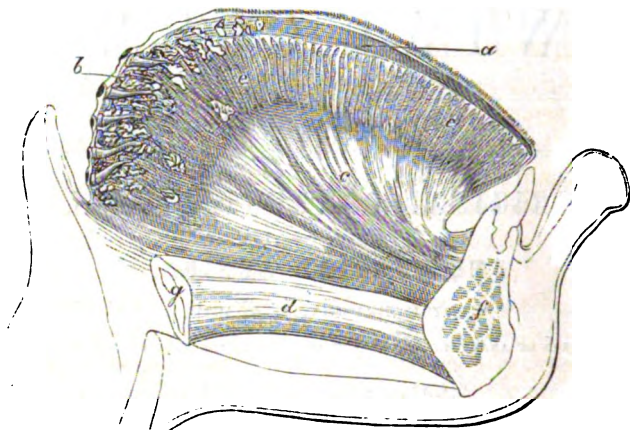
(1) *The Tongue*.—The tongue is a symmetrical organ developed on either side of a median fibrous layer, which arises from the hyoid bone. In the majority of vertebrates, the tongue is in the main composed of the bony equivalent of this fibrous extension, which belongs to the hyoid apparatus, and is intruded thence between the halves of the inferior maxilla. In the higher animals only is there a marked accession of muscular fibers, constituting the familiar anatomical figure.

The tongue has, when released, an ovoidal form, slightly wider behind than in front, with a median groove—the *raphé*—extending along its anterior two-thirds, and answering in position to the central median septum.

The power possessed by the tongue to change its shape is remarkable, and almost defies analysis. A transverse section of the organ is, when the organ is studied at rest, more or less mushroom shaped,—the pedicle answering to the entering fibers of the *genio-hyo-glossus* muscle. The position assumed by the tongue when the lower jaw is elevated is as follows: the tip is raised to the level of the incisors, within whose curve it lies. The apical part of the dorsum rests on the pad of the roof of the mouth behind the incisors. The rest of the dorsum does not lie in contact with the hard palate, though it probably permits the soft palate to lie gently across the posterior part, and the uvula to rest in a slight median depression thereof. The anterior and lateral borders of the tongue are free, while the base and the greater part of the under surface are fixed. The under surface is smaller than

the upper, and the structure of the base of the organ, while more capacious, is less compact than the anterior.

FIG. 33.—ANTERO-POSTERIOR SECTION IN MEDIAN LINE OF THE TONGUE.



a, cortical portion; b, glandular portion; c, genio-hyo-glossus muscle; d, genio-hyoid muscle; e, e, transverse lingual fibers divided vertically; f, inferior maxilla; g, hyoid bone.

The tongue is divided into a *cortex* and *medullary portion*. The cortex (Fig. 33, a) is complete at the dorsum and sides. It is absent at the position of the muscular pedicle. It is composed of a special arrangement of fibers of distribution of the *palato-glossus* and *stylo-glossus* muscles from above, and the *genio-hyo-glossus* muscle beneath. At the point where these fibers are best seen, as at the anterior two-thirds, the cortex is also best developed; where they are sparsely seen, and some of them absent, as at the basal third, the cortex is but slightly expressed. It thus may be said to extend from the palato-glossal folds forward to the tip.

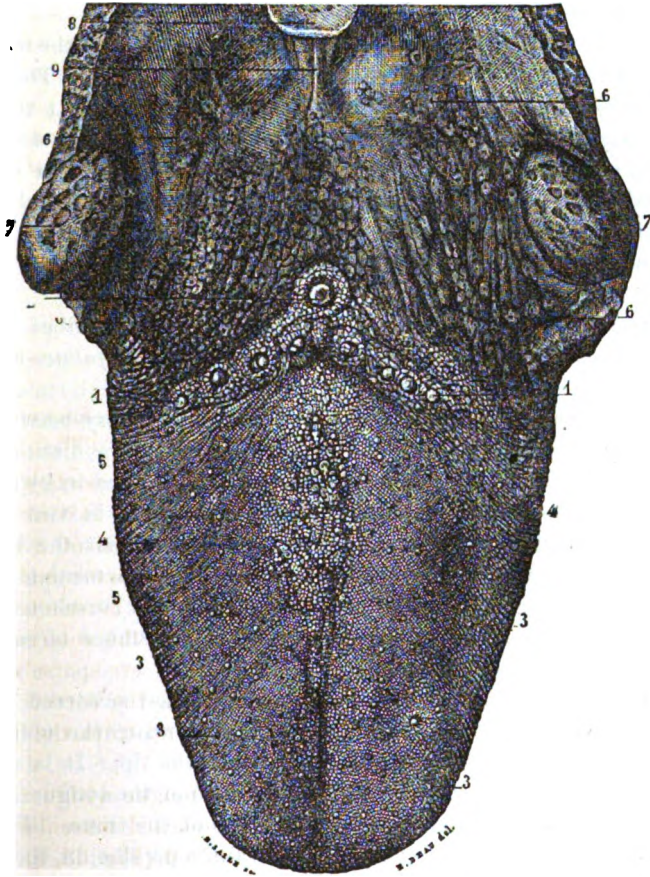
The medullary portion is all that part of the tongue within the embrace of the cortex. It is composed of loosely-packed muscular fibers of the *transverse* (Fig. 33, b) and the *vertical* set (Fig. 33, e). The interstices between them are occupied with fat, which is more abundant toward the base of the organ than elsewhere.

The *mucous membrane* as it is applied to the tongue is seen to correspond to the cortex. It presents some extraordinary modifications of structure, which will now be considered.

Unlike other mucous surfaces, the tongue possesses a fibrous investment over its dorsal surface which is analogous to the derm. It is composed of fibrous laminæ, with some addition of elastic fibers. Beneath it is received a great number of ultimate muscular fibers, and arranged upon it are papillæ in every way representative of the papillæ of the skin. Covering the fibrous layer is the epithelial layer, com-

posed of squamous cells, and so greatly modified in some respects as to recall the structure of hair rather than an ordinary outgrowth from a mucous surface.

FIG. 34.—VIEW OF THE UPPER SURFACE OF THE TONGUE.



1, 2, V-like row of the vallate papillæ; 3, capitate papillæ; 4, 5, conical papillæ; 6, 6, floor of the inter-tonsillar space, with numerous simple follicular glands; 7, tonsils; 8, summit of the epiglottis; 9, the middle glosso-epiglottic frænum, with depressions on each side bounded externally by the lateral fræna.

This peculiar modification is more marked in the oral or anterior two-thirds of the organ than in the pharyngeal or posterior third, where the glandular element is exceedingly well developed. The glands at the beginning of the basal third are arranged in oblique lines directed outward and forward from a median line, but as they approach the epiglottis they are more irregularly distributed. The glands are, for the most part, of the racemose type, and extend thence but sparsely

along the edges of the tongue ; and, in a marked degree of development, a minute cluster is placed between the stylo-glossus and inferior lingual muscles beneath the tip of the tongue. The latter group, generally known as the glands of Nuhn, were well described before him by Blandin, and, according to Hyde Salter,* were in reality discovered by Nuck in 1690.

The Papillæ.—The lingual papillæ are of two kinds,—the true skin papillæ, and those common to the fibrous investment. The latter are the most numerous, and are distributed everywhere. At the sides of the tongue, toward the palato-glossal fold, these papillæ are hemispherical or rounded tubercles, which arrange themselves in more or less vertical ridges. These gradually become interrupted and diminish as the tip of the tongue is reached. These, the simplest forms of papillæ, have been termed the *secondaries*, and are seen aiding in giving prominence to the *primaries*.

The true or primary papillæ have been variously described. They present three different kinds, viz., the *vallate*, the *capitate*, and the *conical*.

The *vallate* are the largest, and placed at the boundary between the oral and pharyngeal division of the dorsum. They are distinguished from other papillæ, as the name indicates, by being walled in by a prominent circle of secondary papillæ. They are arranged in two oblique lines directed forward and outward in such a way that the lines diverge. They vary in number from seven to twelve. A median papilla, larger than the others, is sometimes denominated the *foramen cæcum*. This may be absent or axially duplicated. A number of racemose glands may open in or about it.

The *capitate* papillæ are small and rounded, and scattered on the tongue without special regularity, faintly preserving the oblique direction behind, but slightly aggregated toward the tip. It is thought that within these chiefly reside the tactile sense of the tongue.

The *conical* papillæ are the most numerous of the three. They are arranged in lines parallel to those of the vallate papillæ, in the neighborhood of these structures, but gradually become more transverse as they approach the tip. They are covered with hair-like extensions of epithelial cells, hence the appellation often given them of the filiform papillæ. The fur of the tongue is due to changes in these accretions.

The *arteries* of the tongue are derived from the lingual branches of the external carotid. The vessels are remarkable for their size compared to the organ to which they are distributed, and for the limited communication between the branches of the right and left vessels. Hyrtl, indeed, demonstrates but two points of this anastomosis: one

* Cyclop. of Anat. and Physiology, iv., part. ii. p. 1122.

at the position of the vallate papillæ, and the other toward the tip. An insignificant superficial vessel lies along the line of the raphé, which would be the only vascular structure divided by a median incision upon the dorsum. The extreme vascularity of the tongue has been the occasion of frightful loss of blood when the vessels have been opened in the course of the sloughing of cancer, as well as in non-malignant ulcerations extending into the tongue from the throat.* In that usually unnecessary operation of snipping the linguae frænum, the ranines, by which name the abrupt terminal branches of the linguals are known, may be divided. Cruikshank is quoted in Bell's "Institutes of Surgery" as dividing the frænum in a child, whose mother, after some time, discovered it to be dead from loss of blood. An enormous coagulum was found in the child's stomach. Under guidance, operations on the tongue may be undertaken without fearing loss of blood; this feature being, in the estimation of Paget,† much overrated. It is certain, however, that in the early cases of partial excision of the tongue before the days of associated ligation, the patient sustained alarming loss by hemorrhage.

It is interesting in connection with the distribution of the lingual arteries to learn that unilateral glossitis is not uncommon. Dr. Graves‡ has recorded a typical instance of the kind, occurring in a medical student. The left half of the tongue was affected, and was so enlarged that the mouth could scarcely be closed, while the right side of the organ was in all respects normal.

The veins of the tongue accompany the arteries, and descend to join the internal jugular vein. The branches beneath the tongue are especially conspicuous when the tip is directed to the roof of the mouth. In injection of a solution of perchloride of iron into an epulis growing from the gum of the lower jaw, acute phlebitis of the superficial veins has been excited. The numerous instances of rapid serous infiltration about the supra-hyoid space can be accounted for only when we recall the course of the lingual veins. See in this connection a case by Mr. Holthouse.§

The Localization of Diseased Action.—We divide this portion of our subject into four portions: (a) diseases confined to or appearing on the mucous or epithelial surface; (b) those appearing in the sub-mucous or muscular tissues; (c) diseases of the anterior two-thirds of the dorsum, as contrasted with the posterior third; (d) diseases as influenced by symmetry.

(a) The diseases limited to the epithelial covering of the tongue.

* Am. Journ. of Med. Sci., 1st series, 26, 193.

† Med. Times and Gazette, Feb. 10th, 1866.

‡ Dublin Hosp. Reports, iv. 43.

§ Tr. Clin. Soc. Lond., ii. 140.

These are analogous to or at least mimetic of conditions of the epithelium of the integument, such as *psoriasis*, *ichthyosis*, and *keloid*. The first-mentioned disease as witnessed in the tongue is popularly known as "bald tongue." According to Paget,* it is recognized by smooth patches, which are glossy and remarkable for the absence of the fur which may coat elsewhere the entire dorsal surface. It is commonly of a syphilitic origin.

The next-mentioned disease (ichthyosis) is a rarer manifestation. It consists of a thickening of the epithelium so as to form a white, skin-like layer presenting an uneven surface, which has been compared to a kid glove, wet leather, or a thin film of boiled white of egg. It is of wide extent. In a case reported by Hulke,† a man aged forty-three exhibited the disease, which first presented itself as a patch $1\frac{1}{2}$ " long in the middle line of the tongue. A little less than six years after an operation for its removal, during which interval it had once recurred, epithelial cancer was developed. In a case of Paget's,‡ a woman, aged forty-two, with a hereditary tendency to cancer, exhibited patches of ichthyosis on the right side of the tongue, involving the papillary layer only. Its duration before the appearance of epithelioma was about a year. Dr. Nelegan§ has noticed the same connection between ichthyosis and epithelioma in a well-nourished man with whom the inside of the cheek as well as the tongue were involved. The epithelioma was not developed until over five years from the appearance of the first disease. A somewhat similar case is recorded by T. W. Cooke.||

It would thus appear that of the above affections of the mucous covering of the tongue, one is an accompaniment of syphilis and the other a prodrome of cancer.

The single example of keloid of the tongue known to us is recorded by Mr. Sedgwick.¶

The Fur.—Coming clearly within the limits of this section is the consideration of the fur of the tongue. The physician finds in the varieties of this condition valuable symptoms of systemic disturbance. The surgeon in no less degree detects numbers of signs of local trouble. We will confine our remarks to the latter group of indications.

The fur is always due to an opacity of the cells of the filiform papillæ. According to Hyde Salter,** "it is most abundant where these papillæ are most plentiful, and it will be found, by closely inspecting a furred

* Med. Times and Gaz., 1858, vol. xvii.

† Tr. Clin. Soc., ii. 1.

‡ Ibid., iii. 88.

§ Dub. Quart. Journ. Med. Sci., Aug. 1862.

|| Cancer and its Allies.

¶ Trans. Path. Soc. London, xii. 234.

** Loc. cit., p. 1161.

tongue, that the ungiform papillæ have undergone very little if any change." While it is true that for local lesions the tongue is seldom acutely furred with that dense mat of white on which, as a witty writer has said, one could slide down-hill, it nevertheless often presents some striking features. The chief cause of a localized fur is to be sought for in the area of distribution of a nerve. Thus Hilton* has described a case of a female in which a fur was confined to the anterior two-thirds of the dorsum of one side, and held to be due to irritation of the second division of the fifth pair of nerves. The patient had had hemicrania for years. After death from acute myelitis and "spine-lesion," a scrofulous deposit was found upon the convex portion of the Gasserian ganglion of the opposite side. The same writer mentions a local furring dependent upon an aching tooth. We have seen several cases of acute furring in which the tip of the tongue answering to the incisorial pad was always free.

The glossitis of scarlet fever presents a striking appearance, the result of the contrast seen between the thick, cream-like fur and the enlarged and reddened fungiform papillæ. The latter are compared by Hyde Salter† to the achænia scattered on the surface of a strawberry.

Papillary Hypertrophy.—The vallate papillæ are often enlarged in strumous subjects, particularly in the negro, affected with scrofulous enlargement of the cervical and pharyngeal lymphatics. Exaggerations of the filiform papillæ take on a hair-like appearance. They have been rarely recognized in old debilitated patients. In a case recorded by Dr. Beer,‡ however, the patient was a dyspeptic medical student. True verrucæ, or warts of the tongue, are rare. Syphilitic condylomes are distinguished from other growths by presenting a pale whitish surface on a gradual and nearly level elevation.

Dry tongue, usually due to grave systemic disturbance, may have a purely mechanical origin, as in the case recorded by Dr. Bentley,§ in which it was symptomatic of nasal polypus. In a male, thirty-two years of age, a polypus in the right nasal chamber caused dryness of the tongue for a few lines on either side of the center, extending from the tip almost to the base. The patient kept his mouth habitually open. The dryness disappeared after removal of the polypus.

Cancer.—Since it has been generally accepted that cancer of the tongue is always of the epithelial variety, we find it beginning at the epithelial covering of the tongue. Hutchinson,|| from a study of nineteen

* Lectures on Rest and Pain. Lecture ix. p. 196.

† Loc. cit., p. 1160.

‡ Oesterreichische Med. Wochenschrift, July 16th, 1842.

§ Med. Times and Gazette, vol. x., 1855, 212.

|| Ibid., 1860, ii. 404.

cases, determined lingual cancer to be acute in its character,—a feature which can be explained by the “succulent structure of the tongue, and the facilities thereby offered for growth by infiltration and for rapidity of absorption.” T. W. Cooke* concludes that perhaps the worst form of cancer is that which begins at the frænum. Its progress here is very rapid. The ulceration extends through the muscles which connect the tongue with the hyoid bone and inferior maxilla, and these being largely supplied with arteries, much hemorrhage ensues.

Fissure.—Fissure of the tongue, although generally correctly so denominated, is often covered throughout by epithelial cells, when it would appear to be simply hypertrophy of the papillæ defining the oblique lines. Especially is this the case at the sides toward the region of the vallate papillæ. When denuded at their bases, fissures are often the result of irritation from a sharp angle of a tooth, and in this condition may prove the exciting cause of cancerous deposition. Care should be taken not to confound the undenuded depression with fissure. It is recommended to stretch the tongue during examination. If the depression becomes unfolded and disappears by this manipulation, no fissure exists.†

(To be continued.)

DENTAL PATHOLOGY AND THERAPEUTICS.

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[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the Office of the Librarian of Congress at Washington.]

(Continued from page 341.)

Relative Liability of Teeth to Decay.—It might seem that conclusions upon this subject could be easily reached, and with a considerable degree of uniformity; but even here, observations have led to quite as various teachings as upon any other point of dental instruction.

It had come to be generally regarded as sufficient information, that the *first molars* were most liable to decay; that these were followed in order by the *second molars*, the *second bicuspids*, the *third molars*, or *lateral incisors*, as might be the deduction of the observer, etc., and little was taught even in relation to the relative liability of the teeth of the upper and lower jaws, except that as a rule the teeth of the lower jaw were less likely to decay than those of the upper.

I esteem it as a favor that somewhat early in my own investigations

* Loc. cit., p. 154.

† The Tongue and its Diseases, W. Fairlie Clark, 1873, 150.

in this direction (1867) I was made acquainted with the researches of my friend Dr. Wm. C. Head, who had been engaged in making memoranda upon this point for some ten or twelve years previously, for, although our conclusions are not absolutely the same, they are yet sufficiently unlike all previous classification, and sufficiently in accordance with each other, to excite doubts as to the accuracy of received views, and incite to further observations, which shall be either subversive or corroborative of present statements.

*Tabular statement of relative liability
of teeth to decay.*

WM. C. HEAD, D.D.S.

1. Upper central incisor.
2. Lower first molar.
3. Upper first molar.
4. Lower second molar.
5. Upper lateral incisor.
6. Upper second molar.
7. Upper second bicuspid.
8. Upper first bicuspid.
9. Lower second bicuspid.
10. Lower third molar (wisdom).
11. Upper third molar "
12. Upper cuspid.
13. Lower first bicuspid.
14. Lower lateral incisor.
15. Lower central incisor.
16. Lower cuspid.

*Tabular statement of relative liability
of teeth to decay.*

J. FOSTER FLAGG, D.D.S.

1. Lower first molar.
2. Upper first molar.
3. Lower second molar.
4. Upper second molar.
5. Upper lateral incisor.
6. Upper second bicuspid.
7. Upper central incisor.
8. Upper first bicuspid.
9. Lower second bicuspid.
10. Lower third molar.
11. Upper third molar.
12. Upper cuspid.
13. Lower first bicuspid.
14. Lower lateral incisor.
15. Lower central incisor.
16. Lower cuspid.

It is worthy of note that, with the probability of impossibility of ever again obtaining exactly the same result in a tabular arrangement of this kind, even in the practice of any one individual, the first eight teeth of each table are the same, and that although the relative position of the upper central incisor is much changed, that of the upper lateral incisor is precisely the same, while that of the first and second molars, upper and lower, is practically alike. I have thought that the *average age* of patients from whom were obtained these tables would account for the discrepancy as to the relative liability to decay of the upper centrals, a large portion of my practice being composed of *very young* patients, with many of whom the first molars were in position, decayed, while yet the permanent centrals were not even erupted.

It is also most remarkable that the last eight teeth of each table should not only have been the same, but that the relative position of each is exactly maintained; while again it is found that although some of the lower teeth are vastly more predisposed to decay than some of the upper, and others of the upper teeth vastly more than some of the lower, it is nevertheless true that, as a whole, the upper teeth *are* more

predisposed to decay than the lower, about in the proportion of eight to five.

I do not deem it necessary to enter at any great length upon the subject of the value of such statistics as point to the conclusions offered in this connection, for it seems natural that all would recognize its absolute importance in the formation of correct diagnoses as to the advisability of extraction in cases of irregularity; the warrant of expense in filling and treating cases; the expectation of durability of teeth allowed to remain to subserve the purposes of mastication or to act as supports through the agency of clasps in cases of mechanical work, and other considerations of a like nature. With knowledge of liability to decay, we are enabled to arrive at opinions in all these matters, which time will usually prove to be correct with almost mathematical accuracy.

The demonstration of the position that there does exist relative liability to decay, is a task which only requires time, opportunity, and observation for its accomplishment; but teachings as to the reasons for this assume at once a preponderance of theorizing rather than practicality. We nevertheless have generally recognized as apparently natural reasons for the early decay of the first molars: 1st, the fact of their eruption at a period of life which is too early to admit of the bestowal of any proper individual care for their preservation; 2d, their presence in the mouth during the progress of the various pathological conditions pertaining to the shedding of the deciduous teeth; 3d, the absence of even that care at the hands of parents and nurses which would be accorded them did they possess the knowledge that these teeth were "permanent;" 4th, their formation, organic existence, and early nutrition occurring during that period of life at which great systematic draft upon recuperative power is made by successive diseases incident to childhood.

When we consider the *plausible* reasons for the decay of these teeth, it would seem that they should all fall victims to caries rather than that any should escape; but the very next suggestion in connection with relative liability to decay which is presented to the mind seems to warn us that *all is mere theory*, and must constantly be viewed as such. This suggestion is the prominent position accorded by both tables to the second molars.

It is true that the tabular statement of Dr. Head gives them decidedly less prominence than does mine, and it has seemed to me to be, therefore, likely to be the more correct; but if the reasons advanced in theoretic advocacy of prompt decay of first molars be entitled to respect, the absence of all these conditions in connection with second molars should place them far down in the scale of liability; and yet we have to accept, as the result of statistics, that not only do second mo-

lars rank high in relative liability to decay, but that in this particular the lower teeth take precedence over the upper.

We find next in order the upper lateral incisors. I have already more than once mentioned the curious tendency toward pathological conditions which is evinced by upper lateral incisors from the very eruption of the infantile teeth; it would therefore seem to me as quite a matter of course that prominence in this direction should be found appertaining to these teeth.

Early during my reasonings as to causes for relative liability of decay of teeth, I was impressed with the argument of *position* as tending to favor the establishment of caries in upper front teeth; and even now, with all the observation of a long practice pointing to the immense ravages of decay in bicuspid and molars, I cannot but feel that the frequent alternation of moisture and dryness, which is the habitual condition of the upper centrals and laterals, is certainly conducive to decay.

To the bicuspid, or at least three of them, we find accorded a medium position in regard to decay, which militates with the ideas of former teachers. The old theory of excessive liability to caries on the part of upper second bicuspid from contiguity to decaying first molars, might seem to be somewhat sustained even yet by the statistics which I have presented; but the tabular position of the other bicuspid, and particularly that of the lower first bicuspid, entitles these teeth to especial consideration in questions of utility and durability.

The third molars, or wisdom-teeth, have been invested with a reputation for worthlessness for so long a time that it is quite important that this point should be somewhat thoroughly discussed, in order that the fallacy, which is hinted at by the respectable position which these teeth occupy in our tables, should be exposed even at this late day.

It is true that these teeth are oftentimes found to be decayed very soon after eruption; it is true that the lower third molars are not infrequently found considerably decayed prior to complete eruption; and it is probably due to these reasons that they have obtained the universal condemnation as to quality which is bestowed upon them.

In antagonism to this, we must remember that these teeth are the result of long effort upon the part of comparatively matured economies; that such efforts are not, as a rule, by any means worthless, but, on the contrary, are usually of better than an average quality; that the analogous teeth to these in animals are evidently intended to subserve the purposes of mastication for many, many years, and do this; that the peculiarity of surrounding and overlapping gum-tissue which pertains so markedly to these teeth, would assuredly act equally detrimentally, if not even more so, to other molars and bicuspid, and that we have ample warrant for this position in the decay which we almost

always find resulting from gum covering of bicuspid especially, although of very much shorter duration; that from the inaccessible position of these teeth they are almost never perfectly, and almost always very imperfectly, cleansed; that from the same inaccessibility caries once established is exceedingly difficult to combat, and that even dental operations upon these teeth must necessarily be attended with an amount of difficulty which usually entails a more or less imperfect result.

With these reflections we shall be inclined to think better of third molars; we shall be disposed to deprecate, rather than uphold, their abandonment to decay and subsequent extraction, and be stimulated to increased effort for their preservation.

I have had ample proof in my own practice of the compensation which the third molars, of the upper jaw especially, yield to efforts in their behalf, and have many instances of their maintenance *to do duty as clasp teeth* for twelve or fifteen years after being so completely decayed as to render it questionable whether they were worthy of any attention. The value of the few, which after all this service have been lost, is fully acknowledged by their losers, and I am frequently urged most feelingly by these patients not to relax in energy in this direction, that others may enjoy that from which they had derived so much comfort for so many years.

From the tables we find that the upper cuspids are entitled to rank as very durable teeth. This it is important to recollect in cases of partial artificial dentures for the upper jaw, as it indicates a high degree of worth pertaining to those teeth which, more than any others, maintain the natural expression of the individual.

The lower first bicuspid is found to be still less liable to decay than any tooth previously mentioned. To this statement especial attention should be given, as upon this tooth depends probably more than upon any other one tooth the comfort and health of the possessor.

It is the knowledge of experience that so long as a patient retains so much as the first bicuspid of the lower jaw, a good, serviceable articulation can be obtained for upper artificial teeth,—an articulation with which more real mastication can be done than is usually accomplished with the occlusion of an entire piece of lower artificial work. This is a very important point, one to which full weight should be given, and one which should always cause hesitation as to wholesale extraction of the lower teeth.

To the usefulness of these teeth as masticators may well be added that of supporters to partial lower dentures. The stability which the retention of these teeth will give to such a piece of work is almost incalculable, for at once a very movable appliance, and one which demands almost always much patience, practice, and suffering to utilize, is transformed into a most useful fixture, which is almost at once enjoyed with

very little practice, very little expenditure of patience, and comparatively little suffering.

The durability of lower incisors, and particularly that of lower cuspids, is a fact which was expected, as the peculiar expression which the few remaining teeth of old age give to the individual has long been recognized as resulting from the maintenance of these very organs. Thus these should also be viewed from the standpoint of exceeding durability, and never needlessly, and, above all, thoughtlessly, sacrificed.

(To be continued.)

THE MALPOSITION OF THE WISDOM-TEETH.

BY JAMES TRUMAN, D.D.S.

THE subject I propose to consider, while by no means novel, partakes of a character that it seems constantly necessary to bring up to view. For, either through forgetfulness or a natural perversity of the human mind, matters common are entirely lost sight of in the search for those of a more startling character. Of this class, I number that of the eruption and malposition of the *dentes sapientiæ*. We are called upon daily to treat conditions incident to their development, and so familiar do we become with them, that a certain, and I fear in some cases fatal, indifference is the result. Now, there are no teeth in the series that more imperatively call for close study and constant observation than the *dentes sapientiæ*. They are the cause of more serious lesions than all the rest combined. They are an important factor in the enumeration of the causes of facial neuralgia, and lie at the foundation of many systemic derangements. Yet, notwithstanding their important character, they are to a large extent neglected, and—may I say it—the ignorance resulting from this neglect has been prolific in vast suffering to the human family.

The wisdom-tooth, or *dens sapientiæ*, is, as its name implies, the development of mature years. The popular idea that these teeth are imperfect from their origin, and that they are only erupted to become the seat of premature decay, has only a partial foundation in fact. Judging by analogy, and from well-known laws of nutrition, these teeth should be superior to all others in density, ability to resist destructive influences, and perfection of form. The fact that results are not always found commensurate with expectations, should not be sufficient to vitiate these conclusions. They are undoubtedly as well developed as their fellows. The cause of their deterioration must be looked for elsewhere. In a general way it undoubtedly lies in the fact that their destruction is mainly due, first, to irregular position, as compared with other teeth, and, secondly, to their close environment by

the soft tissues of cheek and gum. This trouble, and its consequences, does not come within the scope of this paper, but is sufficiently interesting to claim special attention.

The malposition of these teeth, as well as their normal eruption, is so productive of neurotic disease that it claims and has received special prominence by writers on this subject, but its importance does not yet seem to be fully appreciated.

It is no uncommon occurrence, in an examination of mouths of persons over thirty years of age, to find several or perhaps all of the wisdom-teeth wanting in the arch. To infer, therefore, that they have never been developed, would be simply supposing an impossibility; nature does not work in this way. The teeth have been developed, but, owing to some obstacle, have either been thrown out of normal position, or from lack of development of the jaw posteriorly have been placed in positions out of view. Where, from whatever cause, these teeth are placed in parts not liable to special irritation, no subsequent bad effects may result, and the individual may never in after-life be conscious of any malarrangement. But, on the other hand, if the tooth be so placed as to impinge on any nerve-branch, the pain may be manifested at certain points throughout the extent of the fifth pair; indeed, it is impossible to say what lesions may result from this cause at parts very far removed from the point of direct irritation. Most of the effects observable in first dentition and the eruption of the permanent molars can be ascribed to the same cause, the only difference being usually in the degree of manifestation.

If, in the process of development of the wisdom-teeth, especially in the inferior jaw, one or both fail to assume the vertical position, it necessarily follows that the crown, or crowns, will be placed horizontally as the tooth advances, and in close apposition to the distal surface of the second molar. As development proceeds from the crown to the radical extremity, no serious disturbance will be perceived. When, however, the progress of the tooth is arrested by the second molar, then growth of the roots necessarily produces pressure, first, upon the nerves of the pulp at the apices, and, secondly, upon some one of the larger branches. There can be but one result,—an almost constant and unendurable torture until the cause is removed. Fortunately for the sufferer, there are intermissions of varying time in the intensity of the pain, for, as Wedl* remarks, "It is a physiological fact that the sensibility of nerve-fibres may become blunted, at least for some time, if they are subjected to severe or continued irritation."

A case illustrating very fully the effects of malposition came recently into my hands for treatment. It also clearly demonstrated the

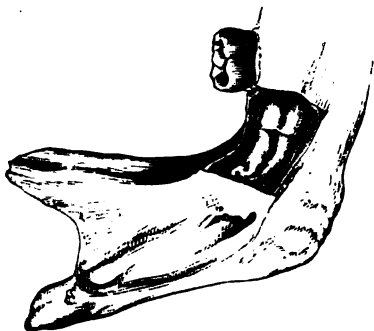
*Pathology of the Teeth, Boardman's Translation, Philada., 1872.

necessity of more information on this subject among a large proportion of those attempting to treat neuralgia.

Mrs. M., a lady thirty-nine years of age, called on me with a note of introduction from a prominent physician of this city, stating that "she was suffering with a most unmanageable neuralgia," and requested my opinion in the case. It required but slight examination to show that the patient was a sufferer of long standing, and she certainly presented the appearance of one to whom hope of ultimate relief was an entire stranger. She exhibited great nervous prostration, together with a loss of hearing, partial paralysis of the muscles of the eye, and impaired vision. My attention was called by her physician to an inferior bicuspid as the probable cause of the trouble, but it was very evident, although it had a dead pulp, that it was not the cause. The examination was then extended to the other teeth, but nothing was discovered indicating their connection with the case. I found, however, that the wisdom-tooth of the left inferior side was wanting in the series. This seemed to promise a key to a correct diagnosis of the case. Sounding the second molar gave indications of a slight peridental inflammation. Passing the instrument down through the gum posteriorly to this tooth, to a point about midway of the length of the root, it struck against a hard body, which was at once decided to be the missing tooth. Further examination satisfied me that the crown was pressing tightly against the posterior root of the second molar, or, in other words, that the wisdom-tooth occupied a horizontal position in the jaw. The treatment was then very plain, and consisted in the extraction of the second molar as the most feasible means of overcoming the difficulty. The patient consented to this operation, which was at once performed. Although more than ordinarily severe, there was a feeling of relief following its removal. Examination then exhibited the wisdom-tooth clearly defined, resting as described.

An examination of the cut will clearly illustrate this position, and the almost certainty of its pressing against the inferior dental nerve. The illustration, reduced in size, is as nearly correct as possible. The extent of impingement upon the inferior dental canal could, of course, only be estimated.

The patient left my office with perhaps the first gleam of hope she had had for many years. On a subsequent visit, three days after the operation, a marked change was evident. She had had no return of the paroxysms of pain, but complained of a dull soreness along the



course of the jaw. There was a decided change for the better in the eyes, but no perceptible improvement in hearing. I saw her again a month subsequent to this. All pain had ceased. Examination demonstrated that the wisdom-tooth had traveled very nearly the entire space made by the extraction of the second molar. Her physical condition had improved materially. Her hearing was very much better, but she still complained of dimness of vision. As this examination took place but recently, I am not able to report the case to its entire completion, but while it may take a long period to overcome the terrible effects of this long infliction, it is reasonable to infer most favorable results.

The history of this interesting case is instructive in several points. She had been a sufferer for a period of twenty-one years. She first noticed uncomfortable sensations about the age of eighteen, and from that period to the present had but slight intermissions of pain. These periods would vary from a few days to two or three weeks. She had gone through the treatment of regular and irregular practitioners, tested the galvanic current and hypodermic injections, applications external and internal, but all to no purpose. She had, as she supposed, thoroughly tested all means of alleviation without result, and could only look forward to the lunatic asylum, or death, as the termination. Previous to her first visit, she had endured two months of continued suffering, the longest continuous period she remembered having had. Twenty-one years of suffering, besides a large amount of useless treatment, might have been avoided by an intelligent diagnosis. Those who have passed through a similar experience can understand the feelings of this lady, as she contemplated a future free from this terrible agony, and her gratitude, expressed with tearful eyes, was more gratification personally than empty honors or large fees.

The difficulty in the diagnosis of this case was that the tooth was buried deeply in the jaw, and, unless its absence was noted, could readily have been overlooked.

The attendant loss of hearing and distinct vision are by no means an unusual accompaniment. Wedl*, in considering this subject, says, "Von Stellwag regards it as probable that irritations in remote portions of the trigeminus nerve may be transmitted through the ciliary system to the nervous apparatus which serves for the reception of luminous impressions, occasion an increased excitation in this, and, by producing hyperæmia and inflammation, give rise to amaurosis (amaurosis trifacialis of Beer)." "It is a well-known fact," he says, "that it is by no means an uncommon occurrence for intense irritations of one or another division of the trifacial nerve to lead to *hyperæsthesia*, and

* Op. cit., p. 438.

later, to hyperæmia and inflammation in the territory of the ciliary nerves. Hyperæsthesia of the ciliary nerves may also be induced by exfoliation of an alveolar process, abscesses in the roots of a tooth, and the impaction of foreign bodies in an alveolus." He cites the following cases in his notes: Galenzowski cured a complete amaurosis which occurred in conjunction with a most violent intermittent neuralgia in the temporal region, face, and especially in the eye, by the extraction of a carious bicuspid, upon the root of which there was a splinter of wood that had produced an irritation of the dental nerves. Teirlink relates a case where an impacted fragment of a tooth in the upper jaw of a woman occasioned frequent attacks of odontalgia, which were accompanied, at different times, by intense pain in the eyes, intolerance of light, a profuse secretion of tears, dimness of vision, contraction and immobility of the pupil. All treatment was unsuccessful until the fragment was removed, when the pain ceased immediately. Hancock (*Lancet*, 1859) reports the following case: A lad, eleven years of age, on waking from sleep, one month previously, found that he was entirely blind. Previously he had nothing the matter with his eyes, and when he went to bed the preceding night he could see distinctly. Treatment had availed nothing. The pupils were dilated, the iris was motionless, and did not respond to the excitation of light. He was unable to distinguish light from darkness. Upon examination of the teeth, Hancock found them tightly wedged and crowded together. Two permanent bicuspid and four milk-molars were extracted; the same evening the boy could distinguish light from darkness, and on the following morning he was able to make out objects. From this time the boy's sight improved, and eleven days after the operation he was discharged, well.

Fox* gives an extraordinary account of a case of exostosis, where pain "commenced in the face, confined principally to one side, returning most mornings at about eleven o'clock, and continuing several hours." He commenced operations by the extraction of one tooth. This gave only temporary relief. All the teeth in the lower jaw were finally removed, except the four incisors. During this time she was most thoroughly treated, if we may judge from the following account: "Frequent scarifying of the gums, leeches, permanent blisters to the lower jaw and behind the ears, astringent lotions, as the infusion of roses, with the tincture of myrrh, decoctions of bark, oak bark, infusion of galls, solution of alum, argenti nitras, salt and water, lemon-juice, oxymel æruginis, borax, charcoal and soda, tepid bath, artificial sea-bath, and, afterwards, sea-bathing, seton in the neck, issue in the arm, etc., etc., with many other applications which it would be

*The Natural History and Diseases of the Human Teeth. London, 1838.
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useless to name." Internally, the treatment was equally severe, but, of course, with no relief. The surgeon, in sending her to Mr. Fox, says, "She has now all the teeth of the upper jaw affected in a similar way to the lower. The palpebræ of one eye have been closed for nearly two months, and, when opened, can discern objects but very imperfectly." All the teeth were finally removed, but not before the other eye had become affected, the sight being so poor "as scarcely to enable the lady to guide herself about the house," although health was materially improved.

The loss of hearing, accompanied by neuralgic pains in that organ, is of very frequent occurrence. A gentleman brought his young daughter to me for examination. She had suffered for some time with a violent pain in the ear. Treatment had been of no avail. He suspected that, possibly, the teeth might have some influence upon it. Examination discovered the exposure of the pulp of the first superior molar. This was destroyed by the usual arsenical preparation, followed immediately by a cessation of pain. Wedl says (*loc. cit.*), "Vautier reported a case of facial neuralgia and deafness which was cured by the extraction of an upper wisdom-tooth."

The development of the sac of the wisdom-tooth taking place in the coronoid process, it necessarily follows that any interruption in the development of the jaw will force the gum into irregular positions. The case described of Mr. M. is an extreme illustration of the horizontal presentation. The following case is of the same character, with this difference, that being above the gum, it was readily diagnosed.

Miss T., a young lady, called on me to have an examination made, having suffered for a long time with severe neuralgic pains. The cause here was very evident. The wisdom-tooth was lying in a diagonal position, with its grinding surface pressing against the second molar. An effort to extract this resulted in a fracture that extended far in the roots, but it was not deemed advisable, at that time, to remove the remainder. All pain gradually subsided by the gradual forward advance of the roots.

I have stated that similar results occur in the eruption of the wisdom-teeth, as well as others in the series. They are more clearly marked, however, in the eruption of the wisdom-teeth, from the fact that the tissues of the posterior portion of the jaw assume a greatly increased tensility. If absorption proceeds slower than development, a retardation of the upward advance takes place, and a corresponding pressure results at the apices. The peculiar neuralgic pains of mal-position or other causes are here present, but limited in duration. While it is undoubtedly true that the pressure of the advancing tooth upon the nerves of the gum has much to do with the painful condi-

tions observed, I cannot understand why such a clear observer as Wedl* should make the following assertion: "When the nerves of the gum are subjected to a severe irritation by the advancing crowns during the first dentition, pain of a radiating character is developed in the sensitive organism of the child, reflex phenomena occur in the form of convulsions or epileptiform paroxysms; in a series of well-observed cases, these symptoms disappeared immediately after the division of the irritated nerves of the gum with the lancet. Hence, in these cases, the center of irritation without doubt was located within the gum. Upon pure theoretical grounds, also, the above-mentioned consecutive irritations of the central nervous system must have their origin in the irritated nerves of the gum." When we take into consideration that roots at this period are not fully developed, and bear in mind the extreme delicacy and sensibility of the nerve-fibers of the pulp, and its connections, it may be theoretically affirmed as true that the principal disturbance does not proceed from the nerves of the gum, but from pressure at the extremities of the imperfectly-developed roots. The cutting of the gum relieves this tension, the tooth advances, and pain ceases. Illustrations of this condition are numerous.

Mr. H., twenty-one years of age, had suffered with general nervous prostration for several days. Suspecting the cause of the trouble, although but slight evidence of external pressure existed, a crucial incision was made through the gum, over the wisdom-tooth. Relief was immediate, all disagreeable sensations subsiding at once.

Mr. M., aged twenty, complained of a constant pain, extending over the superior jaw and temporal region. Not being able to find any direct cause in the teeth, attention was next given to the condition of the superior wisdom-tooth of the right side. There was no evidence of early eruption, but a deep incision was made through the indurated gum. The relief was not immediate, but feeling confident that pain would soon subside, the patient was requested to report three hours subsequently. This he did, but the pain had entirely disappeared.

Mrs. O. was under treatment for several badly-decayed teeth. I had filled them temporarily. In two or three weeks she returned, complaining of a severe and unendurable pain extending over the whole left side of her face. Suspecting the temporary filling as the cause, I removed it, and made applications, but without any relief. The wisdom-tooth of that side not having been erupted, I concluded to lance it, although I could discover no external evidence of extraordinary pressure upon the gum. The lance struck the crown of the wisdom-tooth at considerable depth. Pain ceased at once, but in a day or two she returned, complaining that the trouble had returned.

* Op. cit., p. 484-5.

On examination, I found the crown had reached the surface of the gum, but the posterior cusps had caught under a portion of overlapping gum not freely divided. On separating this, pain ceased, as before, without any further renewal.

The wisdom-tooth assumes many other positions in the jaw, and, as before remarked, may be so placed as not to be a cause of serious annoyance, but these must be considered exceptional. The cases of serious results are more numerous, and are of so much importance that I feel justified in quoting at length.

Forget* says: "A young man, twenty-seven years of age, consulted many of the surgeons of Paris for a swelling of the right half of the body of the lower jaw, which was tripled in size. He was almost incessantly tormented with a dental neuralgia, which had commenced ten years previously, and the patient said that at about the same period he had remarked a slight and circumscribed tumefaction of the jaw beneath the molar teeth—it existed then as a kind of node that remained stationary for a long time. The progress of the tumor had become appreciable only three years before, and its evolution was then marked by continual pain, which was, nevertheless, moderate and not lancinating. My colleague, M. Maisonneuve, was called to attend this young man. He considered it necessary to disarticulate the half of the jaw. He performed the operation in the course of the month of April, 1857, and it was eight days after followed by the death of the patient, which was caused by gangrenous inflammation of the wound and an abundant secondary hemorrhage. . . . The examination revealed the existence, in the center of the tumor, of an excavation containing a large molar, directed horizontally. The crown was in front, and it had acquired its regular development in this vicious position."

A man named Cheron, a wheelwright, "was carried in 1841 to the Hôpital de la Pitié, during the attendance of Lisfranc. He had been for some time subject to violent pain in the teeth, and had thrown himself into the street from the window of his chamber, which was situated under the false roof (combles?). At his entrance to the hospital he exhibited numerous contusions, and he was in a state of profound prostration; during the following night he was attacked with lock-jaw, and died the next day.

"At the post-mortem examination, the inferior left wisdom-tooth was found placed under the gum, which was much tumefied; it was directed from behind forward, its roots corresponding to the base of the coronoid apophysis, and the crown resting against the last large molar, upon which it exerted a strong pressure.

"A man, aged twenty-six years, had been for a long time affected

* Dental Anomalies. White's Translation, Philada., 1860.

with very acute dental neuralgia, which was seated in the alveoli of the last molar teeth of the right side of the lower jaw, which was observed to increase in size through the whole extent of the ramus. . . . The invalid decided to enter the Hôpital de la Pitié, during the services of M. Maisonneuve, who, after laying the osseous tumor bare, applied the crown of a trepan with the intention of finding the tooth which he presumed to be the cause of the malady.

"The insufficiency of this operation made him decide to resect the ramus of the bone, by disarticulation of the condyle and by a cut of the saw through the first large molar.

"The anatomic section was sent to me by my honorable colleague, and I ascertained in it all the characteristics of an osteite in various degrees of development. . . .

"As to the cause of the malady, I do not hesitate to attribute it to the anomalous enlargement of the wisdom-tooth, which was enclosed in the base of the coronoid apophysis, and extended hardly a millimetre beyond the edges of the alveolus, which it had there formed for itself. This, like the dental crown that filled it, was twice as large as it would have been in ordinary conditions, and the wisdom-tooth pressed forward against the neck of the neighboring tooth (second large molar) in such a way as to take position in the dental arch, and necessarily displaced that tooth which had hindered its ascent. Was it on account of this obstacle that the development occurred in the body of the bone?

"A section of the jaw passing under the dental canal, open on its inferior wall, demonstrated to me that a communication existed between it and the alveolus of the wisdom-tooth, which was united there by the extremity of one of its roots."

J. Tomes* quotes from a clinical lecture of M. Velpeau, reported in the *Medical and Surgical Journal* of 1841, the following cases of interest: "A lady, aged twenty-two, suffered with pain in the angle of the lower jaw, left side. It was first thought to be rheumatism, and was treated as such, but without effect. Blisters and seton at the back of the neck, kept open for a month, were tried, and opiates were given, but all to no purpose. . . . Upon making a section into the gum over the wise tooth, a probe passed down led to the discovery that the wise tooth was arrested in its progress by the direction it had taken—directly forwards, its crown coming in contact with the posterior surface of the second molar. The second molar was extracted, and the patient immediately released from her suffering.

"Patient F. Boulanger applied to Velpeau in 1825. The right cheek greatly swollen, the tumefaction extending from the eyelids to the clavicle; several cicatrices, resulting from old abscesses, mark the skin

* Dental Physiology and Surgery. London, 1848.

in this neighborhood. For the last twenty months the patient has not been able to open his mouth, and has therefore subsisted on broths. Three inches down the neck from the angle of the jaw there is a fistulous opening, through which much pus is discharged; lower down the neck there is another fistulous opening. On passing a probe into the first of these openings, it penetrated obliquely backwards about three inches, and then was stopped by a hard body, which proved to be the dens sapientiæ. The patient's health had suffered much from frequent attacks of colic and diarrhœa, indigestion, etc. The mouth was gradually forced open by the introduction of bits of cork and wood between the teeth; the process was tedious, but successful. The tooth was extracted, and in five or six days a sequestrum was discharged, which seemed to belong to the coronoid process; it bore the mark of the crown of the tooth, and thus indicated the obstacle which had opposed the development of the tooth. The second molar was now extracted; eight days afterwards a second piece of bone was removed, and from this time the tumefaction of the neck and face disappeared so rapidly that at the end of twenty days the face had resumed its natural appearance.

"Dr. Fricard, when a student, was attacked in the summer of 1821 with pain in the throat, and in the following November with severe inflammation of the right tonsil. This condition was partly subdued by antiphlogistic measures; but the pain soon returned, and continued, in spite of every means, up to the year 1823. The teeth and gums appeared to be perfectly healthy; and the surgeon was about to extirpate the tonsil, when it was accidentally discovered that the wise tooth on the affected side was not through. The gum was now freely divided, but the portions of the divided gum inflamed, and had to be removed with the knife and caustic. The tooth was thus completely freed, and the obstinate inflammation of the tonsil soon disappeared.

"M. Esquirol informed Velpeau that he had a case of mental derangement, where the patient was restored to reason by a crucial division of the gum, which liberated the wise tooth."

Many more cases might be cited in illustration of the importance of careful attention to this tooth and to its various malpositions, but those already given will suffice.

In all cases of neuralgia, where the teeth are in position, let the examination first begin with the condition of the teeth as a whole, secondly with the wisdom-teeth, and thirdly, any other causes, such as nodular dentine, exostosis, pressure of foreign bodies on the periosteum, etc. Some of these are necessarily obscure, but intelligent observation will enable the operator to detect many, and thus by a careful and correct diagnosis relieve a long-agonized sufferer, and rob facial neuralgia of some of its horrors.

PRELIMINARY TO FILLING.

BY JAMES E. GARRETTSON, M.D.

THE organic nature, habits, and relations of the teeth force upon the observer the conclusion that a prophylaxis and a therapeutics which consider dental deteriorations may do so alone intelligently from that standpoint at which disease and remedy are considered by the practitioner at large.

It is a matter which may strike the dentist only as being of the first importance that natural or induced physical changes shall be made to play the part of the curative instrumentality in dental caries, even though it must be that defects or loss of structure are to find repair in no other way than through the finger-skill of the metal-manipulator.

It is a fact, clearly enough evident to any observer, that the common principles involved in caries of the osseous system at large are found to apply as well to the dental system; and that, if, in certain conditions of the humors of the body, osseous disease is found to be of a chemico-vital nature, so of similar character is caries of the teeth; these organs finding, in a multitude of instances, destruction from causes within rather than from causes without, and, therefore, compelling such general appreciation of their diseases, if means employed for cure shall have in them anything of a scientific signification. What such conditions are is a matter which most earnestly calls for enlarged and persistent investigation on the part of the members of the dental specialty; and so pertinent is such a call, that few things are to be more regretted than that continuous waste of professional time which exhausts itself in the endless discussions about rubber dams and the mechanical performance of a jeweler's handicraft.

How investigations are to be carried on from such general standpoint, the writer must believe he has clearly set forth in the many pages devoted to the subject in his "System of Oral Surgery." What remains to be done will certainly not fail to be evident enough to his intelligent reader.

In the present paper, it is designed, however, to direct attention to certain features of local treatment, having as a meaning organic response on the part of teeth affected by caries.

"A tooth attacked in any part by caries expresses the stages and steps of the inflammatory process, inasmuch as at the first approach of a disturbing cause immediate change occurs in the circulation, and, necessarily, in the nutrition of the part involved, the tubules being filled and solidified, or the attempt being made, by deposit of adventitious matter; the disease, being thus resisted and retarded, conquering only when an external cause of offense is stronger than the vital force which combats it."

Eburnification or vitrification of the dentine is a condition of frequent observation, and a tooth in which such process perfects itself is in a state which no process of filling can improve, except, indeed, it may be as a lost contour is concerned. Tubular consolidation, then, being the natural principle of cure in dental caries, it is of all consequence that the law of such change be appreciated, and that effort be made towards the encouragement of the phenomenon.

Tubular consolidation, like osseous consolidation, implies increased nutritional activity, the process being in no wise different from that which made the formation as it originally existed; a difference being found alone in the matter of arrangement. Making, for example, section, either of irritated tooth or bone, the areolar character of parts is seen to be lost to a greater or less extent, the structure having assumed a solid or cortical nature; such nature of structure being necessarily more resistive to corroding agents than is that of spongy character.

Always is it perhaps a result that nature in the case of dental caries exhibits this effort at defense, and without doubt is it as well the case that where this attempt is not in fair degree perfected, there the process of plugging is of little avail, the caries re-establishing itself in defiance of the most elaborate and mechanically praiseworthy operations which skill may accomplish.

Eburnification of dentine is dependent on that particular grade of vascular action which might be termed hypertrophic; that is, a grade which deposits pabulum in excess, and which tends to organize and nourish, rather than to deteriorate and destroy. Such vascular change is neither of too high nor of too low a character; therefore, for the production of the desired condition, the local vascular changes are to be carefully watched and controlled.

That chloride of zinc proves to the provisional capacity of the dental pulp what iodine is seen to be to repair in ulcers is a fact which has so often demonstrated itself that illustrations are certainly not necessary; hence it is that fillings made of oxychloride are found so frequently followed by the hardening of soft teeth and the preservation of organs in which plugs of gold had failed after repeated trials.

But it is this very virtue in zinc which renders it an article so capable of abuse. That which, judiciously used, excites increased nutritional activity, when employed in excess compels a congestion which finds sequela in stagnation and suppuration. Hence, he who would harden a cavity through pulp-excitation is to measure well his means to the power of the organ on which he acts. In no class of teeth is the danger from zinc greater than in that of loose structure; here it is that the exciting quality of the chloride finds readiest response, so that it is familiar to every practitioner that pulp-inflammations have been almost immediate upon the imprudent use of the zinc-filling.

No teaching can be more amiss than that which leads the inexperienced to look upon oxychloride as a specific protection against the ills of an exposed pulp, and the recommendation of its indiscriminate use so frequently to be met with on the pages of dental journals under the signatures of prominent practitioners is not overmuch to be commended.

Let him who would secure the benefits residing in chloride of zinc esteem it as an antiseptic, and as a physiological excitant; let him take good measure of the pulp and of the responsive nature of the circulation upon which he acts; thus alone shall he find himself able to cover with layers of new dentine exposed nerves, and thus be able to secure that wall of circumvallation which is better for a carious tooth than are all the fine plugs of metal over which so many waste their efforts.

Another matter which has great concern with success in filling teeth is found to lie in a preliminary attention to the parasitic growths so abundantly to be met with in every cavity of decay. Fungi are not, perhaps, to be esteemed causes of caries, but, ingress once allowed, they assuredly fasten upon and insinuate themselves into such cavities, absorbing not only the pabulum designed for the nutrition of the tooth, but interfering markedly with the process of protecting circumvallation just described. Fungi are to decaying teeth what they are to the tree upon which they have fixed themselves, and no more surely do they tend to the destruction of the one than to the other.

Because, therefore, the presence of parasites in carious teeth is the rule, and not the exception, it is not at all necessary that the practitioner resort to his microscope to determine such presence; but, assuming such existence, that he resort to means which, while they shall destroy the fungi if present, will yet be no source of harm should no parasite exist in the cavity to which an application be made. Of these means, none more favorably commend themselves than wood-creasote; this article, because of its cauterant quality, is not only destructive to fungi, but is as well so markedly antiseptic that no character of cavity could possibly be otherwise than benefited by its presence.

It is, therefore, a matter that the judicious practitioner may not neglect, that, preliminary to the introduction of a filling, a cavity of decay be fully saturated with this agent, and that the cotton on which it is applied be retained for at least five minutes before the use of the bibulous paper or other drying means, this length of time being necessary to the result aimed to be secured.

Alternations of alkaline and acid washes will be found to be of much service in such mouths as tend to nourish parasitic growths in great abundance. Carbolic acid soap is a commendable preparation, while sulphite of soda in the proportion of 3i to 3i of water is highly commended by Dr. Aitkins, of Edinburgh.

Still another agent which has seemed to the writer to act with satisfactory result, is the compound tincture of capsicum, used as little diluted as the mucous membrane of the mouth will bear, or, if used directly to the cavity, applied in full strength.

Potassium permanganate of potash, gr. viii to ℥viii of water, is an admirable disinfectant to be employed with all freedom, commencing at least a week before the operation of filling is begun; this sweetens the mouth, breath, and everything with which it comes in contact.

Still another disinfectant which deserves great commendation is found in a union of hamamelis, phenate of soda, cologne, and water:

R.—Fl. ext. hamamelis virg., ℥j;
Phenol. sod. ℥ss;
Aqueæ colognæ, ℥iiss;
Aqueæ, ℥viii.

(To be continued.)

REPORT OF A CASE OF OYSTO-SARCOMA IN THE PRACTICE OF DR. J. E. GARRETSON.

BY H. L. GILMOUR, D.D.S.

THE patient, Miss C., a young lady, seventeen years of age, noticed first a slight swelling over the apex of a lower bicuspid tooth of the left side. This enlargement having nothing threatening in its appearance, being as well without pain, and presenting the common characteristics of the tumefactions found so frequently in association with diseased periodontia, little attention was given it,—the supposition being that the removal of the tooth would be the cure of the enlargement. The extraction was not, however, followed by the anticipated subsidence. On the contrary, the tumefaction increased until, at the time Dr. Garretson was consulted, the volume was about that of the largest size pigeon's-egg, the tumor being elastic to the touch, entirely without pain, the overlying gum presenting that turgidity so commonly found associated with osseous caries, whilst the exploring-needle discovered a softened, honey-comb condition of the bone, yet exhibited in its groove simply blood.

The chronic character of the case, together with the existence of a cellular stroma, which made up the body of the cyst,—which stroma Dr. G. remarks that he has never met with in a case of free, uncomplicated caries, and which, he affirms, is always by its presence to be esteemed good reason for caution in prognosis—prompted in the present instance the diagnosis of caries of a class having other than a local signification.

Allowing the patient the benefit of the uncertainty, an operation was

performed, in which, making simple exposure of the diseased bone, the carious mass was thoroughly removed after the manner of the ordinary operation done with the gouge. Such an operation in caries of a strictly local signification is expected to and does most commonly result in a cure. In the present case, however, as feared, the cellular stroma rapidly reappeared, the line of incision closed, and the tumor assumed its original form,—the exploring-needle exhibiting the bone as again in process of softening.

That cases of this character occasionally assume healthy organization and effect self-cure, Dr. Garretson notices as being within his direct experience. It is therefore assumed to be good practice to wait, if the tumor does not increase in size or exhibit evidences of threatening degeneration. In this case such chance was afforded nature, and the growth remained without apparent change for a period of three months. At the end of this time, however, evident enlargement showed itself, until, at a still later period, the cyst extended from the first molar of the left side to the first bicuspid of the right, and gave every evidence of an imperfectly combated progress.

The absolute necessity for a radical operation being thus clearly and satisfactorily demonstrated, it was decided to expose the diseased bone by such section of the soft parts as is exhibited in the diagram, thus being enabled fully to explore the relations of the osseous implication to the base of the jaw, and to be guided by the information gained as to the nature of the operation done on the parts.



In making section of the lip and base of chin, the arteries one after another, as they were cut, were taken up and tied, thus allowing of a cleanly performance of the manipulations and saving both loss of blood and the inconvenience from its presence in the mouth and throat,—the latter, by the way, a matter of grave consequence, as operations in oral surgery quickly show.

The parts being exposed, a slice was cut from the tumor, which had the appearance of a half-rotten turnip, while the lower boundary of the cyst was found to permit of a section being made outside of it, yet leaving a supporting rim of maxilla, a matter which decided against the deforming full section of the bone.

The soft parts being now cut from the face of the portion of bone proposed to be removed, the base section was made by means of the ordinary metacarpal saw, while the vertical cuts, allowing of the removal, were effected without inconvenience or trouble with a Hey's saw.

The diagram of the face exhibits the parts immediately upon the removal of the section.

The diagram of the part removed shows the base of the cyst and its ragged relation with its boundaries. The undermining of the teeth and the removal of their alveoli by the advance of the disease from about the roots, are well shown in the drawings.

The operation completed and the debris removed, the soft parts were replaced in position by means of harelip pins for the lip, and silver-wire sutures for the cuts at the base of the jaw; and so accurate were the adjustments, and consequently so immediate the union, that on the day succeeding the operation two of the four pins placed in the lip were removed, and also the silver sutures from about the chin; the remainder being taken away, part on the following day, and the remainder on the third.

At the time of writing (three weeks after the operation), the soft parts exist in most admirable union, with every probability of a minimum scar. The lower lip, as would be expected, presents much of the appearance which belongs to that organ in the case of an edentulous jaw, but which of course is to find remedy in an artificial restoration of the parts lost. The rim of bone left—which has always the risk of necrosis to contend with where a section removes the maxillary artery—is in this instance doing most promisingly well, granulations having completely covered it. The patient is about the house as usual, while the inconvenience complained of is trifling compared to what might be expected.

The combative effort made by nature to limit disease of this nature is well shown in the section to be quite analogous to that which occurs in caries of the teeth, the déployé structure of all that portion of the bone bounding the cyst being converted into a mass of almost ivory-like density.

Another fact to be noticed in operations of this class is the quantity of the anæsthetic required. In this particular instance over one pound of ether was used, and an ounce of chloroform.

The treatment of the case subsequent to the operation has been directed entirely by the family physician, Dr. Paul Heritage, to whose judicious and skillful care much of the success is owing.

PROCEEDINGS OF DENTAL SOCIETIES.

GLEANINGS FROM DISCUSSIONS OF THE DISTRICT DENTAL SOCIETY OF THE FIRST JUDICIAL DISTRICT OF THE STATE OF NEW YORK.

BY J. S. LATIMER, D.D.S.

DR. C. E. LATIMER read extracts from the dental journals. He stated that he had tried a solution of vulcanite for repairing broken rubber plates. Experimental pieces so joined and vulcanized broke at other points than at those joined. He read Dr. Codman's strictures on the practice of removing the first molars to make room for the other teeth, and added a hearty indorsement of Dr. Codman's views.

Professor Abbott said he believed Dr. Sage was in error concerning the solution of oxychloride fillings by alkaline fluids. In his own observations he had never found a single case of alkaline saliva. He described a case in which, after exhausting his resources, he reluctantly resorted to extraction, and then found the pulp-cavity filled with nodules of osteodentine. Dr. Jarvis thought the pulp and nodules might have been removed and the tooth saved.

Dr. Fitch thought teeth containing nodules of dentine may generally be saved. Sometimes removes the pulps without the employment of arsenious acid. He related a case in his own practice in which the application of arsenious acid was followed by necrosis of the alveolus. He had treated the case with diluted sulphuric acid.

Professor Abbott thought sulphuric acid too strong and dangerous. He preferred for dressing,

R—Carbolic acid, ʒi;
Glycerin, ʒviij;
Water, fʒviij.

He related a case in which arsenious acid applied to a tooth which had a hole through to the alveolus caused extensive necrosis, requiring a very considerable operation for the removal of the dead bone.

Dr. C. E. Latimer described a case in which a nodule nearly filling the pulp-cavity of a tooth prevented the usual arsenical paste from acting upon the pulp. A solution of arsenious acid in glycerin acted promptly, however; the nodule and pulp were removed, and the tooth made comfortable.

Dr. N. W. Kingsley said the profession had oscillated to every extreme again and again. He believed dentists had often damaged their patients by saving teeth that had better be removed. Persons could lose from overcrowded jaws four, or even eight, teeth with advantage, especially where the teeth are of poor texture.

Dr. W. M. Reynolds stated that he had relieved a patient by removing a tooth in which he was unable to find any cause of trouble, either

before or after extraction. A similar case, judging from the symptoms, presented subsequently, when he gave immediate and permanent relief by shortening the tooth with a file, thus lessening the force of the occlusion.

Professor Bogue regretted Dr. Kingsley's assertion that a man might lose half a dozen teeth without impairing his power of mastication. The Creator is supposed to know what is best for us.

Dr. Fitch had generally found the saliva acid in the cases he had examined.

Professor Abbott stated that the secretions of the mouth are usually acid during sleep, at which time they act most energetically upon the teeth. He recommended lime-water and solution of soda-bicarbonate used as a gargle before retiring, as excellent preventives of caries in the mouths of pregnant women.

J. S. Latimer mentioned having met many cases of oral catarrh, or stomatitis, in which the mucus is extremely abundant and tenacious, destroying the teeth rapidly. In reply to an interrogatory, he stated that he had not met with the condition named in the mouth of a tobacco-chewer. He inquired whether tannic acid may not be remedial for this condition. He did not know that the patients had been mercurialized.

Dr. W. H. Reynolds had met with two extreme cases of the class mentioned by Dr. Latimer; both were children, and had inherited a syphilitic taint.

Dr. Fitch treats constitutionally with the mineral acids before filling in cases of very marked abnormality of the oral fluids.

At a subsequent meeting, Dr. C. E. Latimer remarked something as follows upon "Prevention and Cure of Proximal Caries:" When treating of this subject, the first query naturally arising is, What is the *cause* of the malady? for only by the removal of the cause can the effect be prevented. The antecedent or predisposing causes date far back, even to preceding generations. One of the causes for which dentists are in some degree responsible, is the continual narrowing of the arch by premature extraction of the deciduous teeth and the first permanent molars.

The over-anxiety of mistaken parents, and the cupidity, or possibly the ignorance, of dentists combine to bring the calamity of contracted jaws and irregular teeth upon the innocent children.

Parents do not seem to know that the teeth do not become broader after eruption, but that the jaws grow, and will in time afford room for a better arrangement of the teeth.

Just so far as we can succeed in establishing habits of absolute cleanliness with regard to the teeth among our patients, in that degree shall we succeed in the preservation of those teeth. We should en-

deavor to impress upon the minds of patients the exceeding filthiness of the putrescent food which has been allowed to remain long between or upon the teeth, and in which the microscopical denizens of the mouth so luxuriate.

It is unfortunate for our efforts to preserve the teeth that they receive less thought and attention than any other part of the person.

The kitchen-maid who should prove herself half so filthy with her knives and forks as the average of people are with their teeth, would be promptly discharged without a "character." Only dentists can speak freely and without fear of offending with reference to this important matter, and they should improve every opportunity to present the consequences of negligence of the teeth.

Patients should be taught to brush their teeth longitudinally, by which the bristles will be passed between the teeth and much of the food removed. They should be taught to follow the brush with silk-floss and quill-pick, and educated as to the proper method of using them.

Professor Abbott favored the use of an alkaline wash at night in cases of acid diathesis. He thinks quill toothpicks made quite narrow valuable for cleansing the proximal surfaces of the teeth. He thought contour filling had been overdone, and teeth lost thereby.

Preservation of the teeth should be first in importance,—function and appearance next. Tin, on account of its superior adaptability, is an exceedingly valuable substance for filling teeth. In filling with gold, he preferred to place non-cohesive next the walls, on account of its greater adaptability.

He stated that for his regular patients he would remove the sixth-year molar at nine years of age, as then, when the twelfth-year molar shall come to be developed, they will not tip forward as when the extraction is done later.

C. P. Grout spoke of the inconvenience he had suffered from having had the old-fashioned V-shaped separations made between his masticators. Since the restoration of the normal contour to these teeth, mastication had been a pleasure to him. He emphatically favored restoration of contour, and spoke approvingly of Mack's screws as valuable adjuncts in such restorations.

Professor Abbott has two teeth in his own mouth which were filed for proximal caries fifteen years ago, and has suffered some annoyance from the food crowding between them; but there has been no further progress of caries on the filed surfaces.

S. G. Perry, D.D.S., exhibited a small corundum disk, devised and patented by Dr. Arthur, of Baltimore, for use with the dental engines in separating teeth. He had used them with entire satisfaction. He added that he was greatly pleased with the working of Dr. Arthur's method in his practice. In his opinion it is even better for adults than

for children, whose softer bones permit the subsequent change in position on the part of the teeth.

Dr. Francis deprecated trying to save badly-decayed sixth-year molars for children. He would gladly give five thousand dollars if, by so doing, he could undo the mischief he had done in his daughter's mouth by preserving those teeth until it was too late to prevent the crowding of the other teeth by their removal. Now those crowded and soft teeth are all decayed on their proximal surfaces.

He does not succeed in inducing patients to keep their teeth perfectly clean. Recommends to them the use of lime-water and floss-silk. Likes tin foil and Bevin's stopping (gutta-percha) for proximal cavities for children, preferring them to gold for such cases. Stated that Dr. Dunning had filled two contiguous proximal cavities, the one with gold and the other with gutta-percha, and found afterward that the gold had failed, but the other had remained good. He believed the gutta-percha expanded under the influence of the fluids of the mouth. Sometimes puts gutta-percha next the walls, and makes the balance of the filling of oxychloride.

Charles Miller, M.D.S., stated that the late Dr. Varney claimed, from experiments performed out of the mouth, that gutta-percha does not expand in dental cavities.

Dr. Carr stated that Dr. Geo. Bernard informed him of his (Bernard's) successful treatment of several cases of alveolar abscess by abstracting the pus and gas with a syringe, using no other remedies.

Drs. Hurd, Gibson, and C. E. Latimer stated that they had successfully employed the same method.

Dr. Gage had formerly removed the sixth-year molars as a rule, but he had since found that in some of those instances he might have served his patients better by preserving them.

Dr. Carr said he does not hesitate to remove those teeth when they are poor and there is a decided tendency to caries in the other teeth. He cited a case from his own practice in which he pursued the opposite course, to the patient's subsequent detriment.

Dr. Hurd preferred to remove the second bicuspid instead of the molars.

Drs. Carr and C. E. Latimer related cases in which gutta-percha had lasted well a dozen years. The latter gentleman had suffered in his own person the consequences of the loss of the sixth-year molar, and he did not wish to inflict such annoyance upon his patients. If, instead of removing them, they be preserved until later in life, they become harder and often do excellent service, as their size and positions make them the most serviceable teeth in the mouth. He does not accept the recommendations of Dr. Arthur, but restores the contour, instructs his patients, and provides them with the means of keeping their teeth clean.

Dr. Francis dislikes to extract teeth, but feels that he should do that which will be for the patient's best good in years to come. If he can save twenty-eight teeth through life, he is satisfied.

Dr. Bronson separates soft teeth when caries has attacked their proximal faces, using Arthur's disks and method. When freely and permanently separated, and then well polished, he is enabled to get ready access to the surfaces for inspection or filling, and the patient is enabled to keep them clean. He finds the disk a great revelator of unsuspected cavities.

Dr. C. E. Latimer described a case of fatal blood-poisoning from lancing an abscess, the pus from which was conveyed by the imperfectly-cleansed lancet into the circulation of another patient.

J. S. Latimer reported that he had been experimenting somewhat with oxychloride of zinc. He had found that a pound of prepared oxide and chloride, which costs the consumer sixty-four dollars, costs to manufacture so little that fully sixty dollars is profit to the manufacturers and venders. It is significant that the gentlemen who have so long prepared this material for the profession are not themselves practical chemists. No very great amount of knowledge or skill is requisite for its preparation. He had procured a pound of the zinc-oxide made by Powers & Weightman, and another pound of "fine" silic prepared by Dr. S. S. White. The former cost sixty cents, and the latter fifty. As the zinc-chloride is hardly more than a dollar and a quarter per pound and water is cheaper still, it may be readily seen that the profits are not small. He saw no reason why this extraordinary profit should be continued. He proposed to experiment further, and would report progress.

Dr. Preterre had used oxychloride of his own making for several years. His oxide costs him ten cents per pound, and he is now on his fifth pound. His formula is three parts (by measure) of the powdered glass, and one of zinc-oxide. He colors with titanium and lampblack.

The following resolution was offered by J. S. Latimer, and seconded by Charles Miller:

"Whereas, It has come to our knowledge that some of the dental schools have refused instruction to women because they were women; therefore,

"Resolved, That we do hereby assure the said schools that, in our opinion, the better part of the dental profession in our country desire the thorough qualification of every practitioner of dentistry, without regard to the sex of that practitioner."

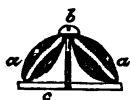
Drs. Fitch and Abbott strenuously opposed the resolution, on the ground that women attending the surgical clinics and anatomical lectures in the same classes with young men are frequently shocked, mortified, and abashed by the indecorous conduct of the male students.

They desired the thorough education of women, and did not object to their pursuing any honorable calling, but believed they could be better taught in separate schools.

J. S. Latimer defended the resolution, claiming that in lectures appropriate to dentistry pure-minded lecturers could say all that need be said without shocking the modesty of any. He furthermore stated that in the grammar schools it had been observed that in those attended by both sexes the conduct grade is much higher on account of the elevating and refining influence of the sexes upon each other.

A motion to indefinitely postpone further consideration of the resolution was carried, Drs. Fitch and Abbott voting for and J. S. Latimer against the motion. No other members voting.

Dr. A. C. Hawes described a simple appliance he had devised for bringing central incisors into line when rotation is required. From the diagram the principle will be easily understood. (a) The centrals to be rotated. (b) The bolt passing between the teeth, its head resting against the labial surfaces, and the shaft made to screw into the short bar (c).



With this simple appliance he had succeeded admirably, without encumbering the mouth with a large and troublesome apparatus.

(To be continued.)

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE seventh annual meeting of the American Academy of Dental Science will be held in Boston, on Monday, September 28th, 1874, at ten o'clock A.M.

The annual address will be delivered by Dr. W. W. Allport, of Chicago.

E. N. HARRIS,

Corresponding Secretary.

THE SOUTH CAROLINA STATE DENTAL ASSOCIATION.

THIS association held its annual session in the city of Charleston on the 16th, 17th, 18th, and 19th of June. The meeting was the most successful and interesting of any held since its organization, and in point of representation the most numerous; resolutions were offered to have the proceedings published as soon as they could be compiled.

A bill was framed to be presented at the next session of the legislature, to regulate the practice of dentistry in South Carolina.

The following officers were elected to serve for the ensuing year:

President.—Theo. F. Chupein, Charleston, S. C.

1st Vice-President.—G. F. S. Wright, Pomaria, S. C.

2d Vice-President.—M. Bissel, Camden, S. C.

Corresponding Secretary.—C. C. Patrick, Charleston, S. C.

Recording Secretary—J. W. Norwood, Greenville, S. C.

Treasurer.—T. W. Bouchier, Cheraw, S. C.

J. W. NORWOOD, *Recording Secretary.*

THE AMERICAN DENTAL CONVENTION.

THIS organization, which holds its twentieth annual session at Saratoga on the 11th of August, has done much towards the elevation of our profession. It is conducted upon democratic principles, and, opening its doors to all reputable practicing dentists, numbers among its members many of the brightest intellects in our ranks. The friends of the convention anticipate a large attendance at the coming session. Dr. T. W. Evans, of Paris, is expected to deliver the opening address, and many of the most prominent and influential members of the profession will be in attendance and participate in the discussions.

A cordial invitation is extended to every practicing dentist who feels interested in the advancement of dental science to be present.—J. G. A.

EDITORIAL.

WE regret that we have been compelled to lay over various communications and reports which we should have been glad to present in this number, and must ask the indulgence of contributors for the non-appearance of their favors as promptly as we should like. Meanwhile, we invite attention to the varied and interesting character of the contents of the journal.

PERISCOPE.

DEFECTIVE EDUCATION.—Our system of education is principally a process of mental stuffing. The habit of examining and criticising evidence is nowhere taught except in our law schools, and there only very imperfectly. To accept as true all that established authority says is true, and to store up such statements in the mind by an effort of memory, is the kind of training which principally prevails. And if it be granted that most of the utterances of accepted authorities are true, the power to criticise evidence, to determine that which is true or false, and to arrive at just conclusions, is still of far higher value than the mere memorizing of facts. But the fault is not alone confined to the cultivation of a habit of accepting statements of truth solely upon authority. It is equally true that things are taught in our schools of which, to say the least, their truth is yet an open question, and upon these doubtful questions it is insisted, more strongly than upon any others, that they should be blindly accepted upon authority. We cannot better close these remarks than by the following pithy sentence from Professor Youmans: "The first step toward truth or verification of opinions is a

skeptical state of mind in regard to what has hitherto passed as truth."
—*American Artisan*.

THE FAITH OF A PHYSICIAN.—I have an abiding faith in the unlimited possibilities of medical science. The day will come when physicians shall be familiar with the chemistry of diseases; when they shall know the exact poisons that produce them, and their antidotes; when they shall look upon the cure of maladies as simply a series of chemical problems and formulas; when they shall melt down all calculi and necrosed bone chemically, and not remove them by surgical operations; when hemorrhage shall be arrested, not mechanically, but by the simple application of gases and washes; when wounds shall be swiftly healed by first intention,—the ravages of tubercles shall be stayed,—fevers and inflammations shall be blotted out; when all morbid growths may be melted down,—cancer cured; when all morbid organic germs may be destroyed; when contagion may be annulled; and thus the average duration of human life shall be lengthened, so that the ancient prophecy may begin to be fulfilled: "The child shall die an hundred years old." With *force, matter, mind*—the trinity of humanity—what may not be accomplished?—*Dr. De Laskie Miller, in Chicago Journal*.

EFFECTS OF ETHER AND CHLOROFORM.—The general conclusions arrived at by the Chloroform Committee of the Royal Medical and Chirurgical Society of London, regarding the effects of ether and chloroform on the circulation and respiration, are as follows:

ETHER INHALATION.

CHLOROFORM INHALATION.

(1) *The Heart.*

The muscular movement is but little influenced. The first or stimulating effect is less sudden and more sustained. Even after insensibility is attained, its action is more vigorous. Ether may be considered in a certain degree as a stimulant to the heart's action. The mercury of the hæmadynamometer at first is absolutely raised, never falling until the respirations cease.

The heart is at first stimulated and its contractive force augmented; but after this its action is depressed, and although the respirations go on properly, its action, as shown by the hæmadynamometer, when connected with the circulation of the animal, fails, and the mercury falls.

(2) *Respiration.*

With strong inhalation there is a temporary arrest of respiration, but it is less marked than with chloroform. With small quantities there is no arrest of the breathing, although the number and depth of the respiratory efforts are diminished. After a short time the respirations become full and slow; and next, while their frequency rises, the range of their movements is reduced.

With strong inhalation there is a temporary arrest of respiration dependent on spasm. This arrest after a few seconds ceases, and inhalation can again take place. With smaller quantities the inspirations become gradually shallower, and for a time retain their natural order, but become less frequent, and after perfect insensibility is produced the amount of air entering the chest is extremely small.

(3) *How life is arrested.*

The effects produced in a strong quantity equaled those of chloroform in a small, but with an important contrast, that it exerted but very slight depressing influence on the heart. Death occurred by failure of respiratory movements, the heart's pulsations continuing generally for some time after the respiration had ceased.

Strong inhalation caused the pulse and respirations to cease nearly simultaneously. In the majority of cases the pulse stopped before the respiration, and the heart's action could be distinguished for some time after the pulse had ceased.

The main points brought out here are, that the effect of chloroform is primarily upon the circulatory system, that of ether upon the respiratory. These conclusions Professor Schiff's investigations corroborate; but he makes important additions to them. He says that even when etherization is pushed to such an extreme that the respiratory movements cease, life is, notwithstanding, never menaced if artificial respiration be at once employed. Chloroform, on the other hand, acts primarily and specially upon the vaso-motor nerves both of the heart and blood-vessels, so that the pressure of the blood within them is speedily lowered, whereas, in the administration of ether, it is never very materially diminished, and often increased. Both ether and chloroform, when pushed to the extreme, paralyze (1) the respiratory movements, (2) the vaso-motor nerves in general, (3) those of the heart; but ether invariably produces its effects in this order, while in the case of chloroform the order varies. And even when respiration ceases first, and the administration of chloroform is stopped, and artificial respiration employed with apparent success, the temporarily re-established respiratory movements may again cease, and death ensue, owing to the disturbance of the circulatory system. This, Professor Schiff states, is never the case with ether; for if the respiratory movements be once re-established by artificial means after this agent has caused their cessation, they always become more frequent when the animal is left to itself. From the results of his experiments, Professor Schiff goes so far as to say that in the present state of science every medical man is responsible for every case of death occasioned by the administration of ether, since he can prevent death if he carefully watches the respirations; but this is not the case with chloroform, as its fatal effects vary with idiosyncrasies which the physician is unable to recognize.—*Bibliographical, in The Lancet.*

TREATMENT OF CHLOROFORM ASPHYXIA.—Dr. Campbell, of Paris, recommends, in a late number of the *Journal de Thérapeutique*, to place persons threatened with death from inhalations of chloroform head downwards and feet upwards for between ten and fifteen minutes. He considers that death arises through syncope due to cerebral anæmia; hence the advantage of inducing an artificial cerebral congestion. The usual efforts at mechanical breathing, excitement of respiratory nerves, the drawing out of the tongue, insufflation into the lungs, etc., may be had recourse to concurrently. Dr. Campbell mentions only one case where this method succeeded. It was suggested by Nélaton during an operation performed at Paris by Marion Sims. It would appear that the late Professor Nélaton was the first surgeon who introduced this practice. The author also thinks that the inverted position tends to drive from the lungs and trachea pent-up vapors of chloroform, which were increasing the asphyxia.—*The Lancet.*

BROMIDE OF POTASSIUM IN DENTAL IRRITATION.—Bromide of potassium in cases of dental irritation in infancy is so salutary in its effects that the gum-lancet need scarcely ever be resorted to. It should be administered in doses proportionate to the age of the child, and repeated according to circumstances. The remedy is of service in the treatment of all local diseases except gastro-intestinal irritation and renal disease, where convulsions are threatening.—*Dr. J. Lewis Smith, in Medical Record.*

TIC-DOULOUREUX CURED BY ICE.—Dr. B. M. Walker, of Plymouth; N. C., reports, in the April number of the *American Journal of Medical Sciences*, a case of a lady, aged sixty, who had been suffering at intervals for over five years, and, under treatment, using various remedies and attending mineral springs with only partial and temporary relief. Dr. W. saw where Dr. Winternitz treated a case successfully by the local application of ice. The patient applied the ice directly to the seat of pain, which was in the fifth pair of nerves, at the same time holding brandy in her mouth. Although the pain was regularly paroxysmal and intermittent, it never returned. The ice was kept to the part as long as it could be borne.—*Southern Medical Record*.

CHLORAL HYDRATE AND CAMPHOR AS A LOCAL APPLICATION IN NEURALGIA.—It is stated that the intimate mixture of equal parts of chloral hydrate and camphor will produce a clear fluid which is of the greatest value as a local application in neuralgia. Mr. Lenox Browne relates (*Brit. Med. Journ.*, March 7th, 1874) that he has employed it and induced professional friends to do so, and that in every case it afforded great, and in some instantaneous relief. "Its success does not appear," he says, "to be at all dependent on the nerve affected, it being equally efficacious in neuralgia of the sciatic as of the trigeminus. I have found it of the greatest service in neuralgia of the larynx, and in relieving spasmodic cough of a nervous or hysterical character." It is only necessary to paint the mixture lightly over the painful part, and to allow it to dry. It never blisters, though it may occasion a tingling sensation of the skin. He has found it also an excellent application for toothache.—*Medical News and Library*.

AQUAPUNCTURE IN THE TREATMENT OF NEURALGIA.—Dr. Siredev has employed aquapuncture for the last three years, for the relief of sciatic, intercostal, and ileo-lumbar neuralgia, and has always found it to produce considerable relief, and sometimes a cure, by a single application. The process of aquapuncture consists in forcibly projecting with a particular apparatus an extremely fine jet of water upon a point of the skin. This produces at the spot a small raised blister with a minute orifice at its summit, from which flows a fluid colorless or sometimes tinged with blood. After a few hours the blister falls, and the following day a small dark scab is found in its place.—*L'Union Med.*, March 3d, 1874, from *Bull. de Thérap.*; *Medical News and Library*.

CASES OF NEURALGIA TREATED BY PHOSPHORUS.—Dr. Bradbury has, in the out-patient department, been lately testing the value of phosphorus in neuralgia. On the whole, he has met with considerable success from its administration. The following are two cases in which the drug effected a cure when other remedies had failed :

Case 1.—E. P., aged twenty-four, single, shopwoman, living in Cambridge, was first seen on October 29th, 1873. She had suffered from trigeminal neuralgia of the left side for three months. As the bowels were confined, and she was somewhat anæmic and the catamenia scanty, a draught containing one grain each of sulphate of iron and sulphate of quinine, five minims of dilute sulphuric acid, and half a drachm of sulphate of magnesia, in an ounce of peppermint-water, was ordered thrice daily. She persevered with this mixture till December 22d, with only slight improvement. On this day the pain was very severe, and she was ordered a phosphorus capsule (= one-thirtieth of a grain of phos-

phorus), to be taken twice daily after food. After taking two capsules, the pain entirely ceased; and on January 12th, 1874, the patient was discharged quite well, having had no recurrence of the neuralgia.

Case 2.—E. H., aged forty, married, and living at Haslingfield, first came as out-patient on November 29th, 1873. For eight weeks she had had very severe trigeminal neuralgia, her features being expressive of great suffering. She was suckling her baby, although the child was fifteen months old. She was directed to wean the baby, and to take a mixture containing two grains of quinine and fifteen minims of tincture of sesquichloride of iron in an ounce of water twice daily. On December 6th, there was no improvement. As cases of *agua* had been admitted from this locality, Dr. Bradbury thought it possible the neuralgia might be of a malarious character, and ordered a mixture containing five minims of solution of arseniate of soda, one drachm of the tincture of hop, and half an ounce of water, to be taken thrice daily with the meals. A chloroform and belladonna liniment was also prescribed to be applied to the painful part. When next seen (December 20th) she was as bad as ever, so a phosphorus capsule was prescribed, to be taken thrice daily after food. The patient was also ordered to rub into the temple every night a little aconitine ointment. The relief from this treatment was most marked; and when the patient was last seen on January 31st, 1874, there had been no recurrence of the pain for more than a month. —*Addenbrooke's Hospital Reports, in British Medical Journal.*

GELSEMINUM IN ODONTALGIA.—I desire to draw attention to the value of *Gelsemium sempervirens* in the treatment of some forms of odontalgia. Since reading Dr. Wickham Legg's paper, published in May last, advocating the employment of the drug in cases of odontalgia, I have frequently used the remedy for the relief of toothache and some allied affections among my out-patients. *Gelsemium*, commonly called the yellow jasmine, is not very generally known to English practitioners, although it has been largely used in medicine for some years in the United States. The drug seems to act mainly upon the nervous system, impairing the sensibility of the sensory nerves. American pharmacists prepare a liquid extract; the dose of the powdered root is from one to two grains. I have used a tincture made from two ounces of coarsely-powdered *gelsemium*-root macerated in a pint of rectified spirit. In hospital out-patient practice, we meet with a large number of cases of neuralgic pains in the face and jaws, associated with carious teeth, but unconnected with any evident local inflammatory changes. The patients are frequently badly-nourished women. In such cases I have given the tincture of *gelsemium* in doses of fifteen minims every six hours in an ounce of dill-water. Out of about twenty cases, I do not think the use of the remedy has failed to be followed by decided and lasting relief in more than three or four instances. The pain did not usually disappear till after the third or fourth dose. I have seen enough of the employment of *gelsemium* to feel sure that more extended experience and careful investigation of its action will establish the drug as a valuable addition to our *materia medica*.—*James Sawyer, M.D., in British Medical Journal.*

GELSEMINUM (YELLOW JASMINE) IN FACIAL NEURALGIA.—*Case I.*—S. W., aged thirty, confined eight months ago, not suckling, anæmic, for twelve months had been suffering with grinding, shooting pain in

the teeth, jaws, and temples. The pain was generally worse from nine to ten A.M., sometimes at night. Eating brought it on. She had several stumps; but the dentist said that nothing was to be done. She had tried many medicines. She was ordered tincture of gelsemium, ten drops in water thrice daily. She was relieved by the first dose, and the improvement continued whilst she was under observation and taking the medicine,—two to three weeks.

Case II.—T. B., aged thirty-nine, complained of violent stabbing pain from the mastoid process over the side and front of the head, coming on from three to six A.M. This had continued for three weeks. There was no known cause, except a fall on the part seven months ago. His general health was good. He was ordered five grains of quinine before the paroxysm, fifteen grains of ammonium chloride thrice daily, and liniment of chloroform. He got no definite relief, except from the last mentioned, and at his next visit was ordered three drops of tincture of aconite. From this he had much relief for a few days, when he relapsed. Pain was now felt more in the jaws and left side of the face. He was ordered ten drops of tincture of gelsemium, and got distinct and decided relief, which continued whilst under observation.

My note-book contains now many similar cases, which warrant me in adding my testimony to that of Dr. Legg, and to that of my friend and colleague Dr. Sawyer. I have ample evidence of the power of gelsemium to relieve pain, especially—I do not say only—in branches of the fifth nerve; and medicines that relieve pain are the most valuable we can have. In toothache from caries or irritated nerve, I do not know that we often think of any but local treatment, unless sometimes aconite or large doses of quinine; yet in very many cases gelsemium will relieve markedly. Its use, as may be said of most neurotics, is not free from some danger; but I have only seen unpleasant symptoms once, and then from an American liquid extract in doses of five to ten drops (the dose marked on the label). These symptoms were dimness of vision and extreme prostration. They soon passed, but may serve to remind that the evidences of the physiological action of the drug are loss of sight, double vision, headache, paralysis. Several cases of accidental poisoning have exhibited these; the few recorded fatal ones were all of children to whom extravagant doses had been given. The preparation I now use is a tincture made according to the usual pharmacopœial mode (e.g. as tincture of aconite), but with two ounces of root to the pint of spirit. It was first prepared here by the hospital dispenser, Mr. Dewson, and is now kept by Messrs. Southall. The dose ordered was from five to twenty drops, and with this, among a large number of out-patients, I have had no cause for anxiety. As the "Therapeutic" corner of our Journal is now and usefully occupied concerning tetanus, I will point out that gelsemium, from its paralyzing power, ought, *a priori*, to be of use in that malady.—*Edward Mackey, M.B., in British Medical Journal.*

OATMEAL AS INFANTS' FOOD.—In a communication to the Société Médicale des Hôpitaux, MM. Dujardin-Beaumetz and Hardy make known the results of the employment of oatmeal on the alimentation and hygiene of infants. According to them, oatmeal is the aliment which by reason of its plastic and respiratory elements makes the nearest approach to human milk. It also is one of those which contains most iron and salts, and especially the phosphate of lime so neces-

sary for infants. It also has the property of preventing and arresting the diarrhoeas which are so frequent and so dangerous at this age. According to the trials made by M. Marie, infants, from four to eleven months of age, fed exclusively upon Scotch oatmeal and cow's milk, thrive very nearly as well as do children of the same age suckled by a good nurse.—*Gazette Médicale*.

GLOSSITIS.—John Maugan, laborer, aged fifty, hitherto a healthy man, was attacked with glossitis on the evening of the 1st instant. I was called to see him on the fourth day afterwards, when his friends—he could not speak intelligibly himself—gave as the history of his present attack, that at the time above mentioned, while at supper, he was suddenly seized with pain in his tongue, and had to leave off eating, and that for the following days he could not take any solid food into his mouth nor sleep at night.

On the occasion of my visit I found him sitting at the fire, mouth wide open, tongue protruding and very much swollen, with much salivation. On examination I found it greatly congested and very hard, and when he would attempt to put it out farther the point would be directed to the left side, and, besides, the left half was manifestly more congested. The sublingual tissues also were in a similar state.

Externally the angle of each jaw was much swelled. I made several deep incisions on the under surface of the tongue on each side of the raphe, and also into the sublingual tissues, which conveyed the sensation as if I had been cutting through cartilage. I then got him to keep gargling the mouth with water as hot as he could bear, so that there came away a good quantity of blood, and before I left he expressed himself as greatly relieved. Saw him again on the 7th, and made a few more incisions, as before, on account of some thickening that remained in the parts; but he was in every other respect much improved, and could take food. I finally saw him on the 12th, when he was able to pursue his usual labor. No other treatment was used in the case than as stated above, except the addition of some warm poultices externally. It was one of pure idiopathic glossitis. I received the *Medical Press* on the 5th instant, and curiously enough, on looking over it, I found some cases, reported by Drs. Ward and Ormsby, presenting a striking pathological identity in almost every respect.

As the affection seems so rare, and as there is much importance attached to it, I have been induced to send this communication.—*J. M. Keogh, M.R.C.P., etc., in Medical Press*.

RECURRENT GLOSSITIS.—Mr. A. M. Ward read before the Surgical Society of Ireland the history of the case of a lady, upwards of seventy years of age, who had been the subject of six successive attacks of glossitis. Having remarked that, so far as he was aware, no case in which inflammation had attacked the tongue more than once had been recorded, Mr. Ward referred to the writings of early and modern surgeons on glossitis. The patient had her first attack in May, 1867, without any apparent cause. She had three similar attacks in the same year; each attack apparently exceeding in severity the preceding one. She was treated in the usual manner, viz., by scarification of the tongue, etc., in these attacks, all of which were rapidly recovered from. She had no attack from Nov., 1867, until June, 1869, at which time she came under Mr. Ward's care, with an attack precisely similar to

those she had had previously, and which was immediately relieved by precisely similar treatment. The swelling was entirely confined to the left side of the tongue. The following month, July, she had another similar attack, the convalescence from which was somewhat more tardy than from the former ones. It was now suggested by Dr. Quinan, who saw the case, that the glossitis might be due to a set of false teeth which the lady wore. She was induced to give up wearing them, and had no further return of the attacks to which she had been so subject. For a long time prior to her death, she suffered from a profuse salivation, without any apparent cause, and had several attacks of lumbago—a complaint which she had not been previously subject to. Mr. Ward called attention to the following points of interest in the case: (1) The frequency of the attacks; (2) their suddenness of access, without any premonitory febrile or constitutional disturbance; (3) the termination of all the attacks in resolution; (4) the rapidity of convalescence after local abstraction of blood; (5) the possibility of the attacks having been due to the wearing of false teeth; (6) the limitation of the swelling to the left half of the tongue; and (7) the absence of all local ill effects.

Dr. H. Kennedy suggested that gout might have been the cause of the glossitis in the case Mr. Ward had detailed. He (Dr. Kennedy) had also seen two cases of glossitis occurring in connection with urticaria.—*Irish Hospital Gaz.*, March 2d, 1874; *Medical News and Library*.

ICHTHYOSIS LINGUÆ.—Mr. W. Fairlie Clarke read a paper "On Ichthyosis Linguæ," illustrated by cases. The author said the term "ichthyosis" was first applied to a morbid condition of the tongue by Mr. Hulke in 1864. In its earlier stages the disease has something in common with warts and corns, and with "papillary tumors of the gum." But it is distinguished both pathologically and clinically from these affections in two ways. 1. It attacks only the tongue and the inside of the mouth; no other mucous membrane is subject to such an affection. 2. It slowly spreads, but gives only slight inconvenience and no pain. In this state it may remain many years, but sooner or later it assumes the characters of epithelial cancer. Ichthyosis linguæ manifests itself in an overgrowth of the papillary and epithelial elements of the mucous membrane, and it is the dorsum of the tongue which is affected in the majority of instances. In some cases the enlarged papillæ may be seen sprouting up in small groups; in others, the whole of the affected surface is smooth, hard, and almost cartilaginous. It presents either a silvery or a snow-white appearance, quite different from any fur which ordinarily covers the tongue. When the disease has once manifested itself, it is very persistent. Though it sometimes responds a little to treatment, and though it varies slightly, it never wholly leaves a spot which it has once attacked. The essential nature of the disease appears to be that of a chronic inflammation, accompanied by an overgrowth of the papillæ and a loss of power to throw off the effete epithelium. The irritation which gives rise to this inflammation sometimes acts on the periphery of the nerves, and sometimes it is situated between the periphery and the center. It would appear that any persistent or oft-repeated irritation of the lingual branches of the fifth pair is capable of causing the disease in persons who have a strong inborn tendency to the development of warty growths under slight causes. If

a portion of the ichthyotic coating be examined under the microscope, some increase in the thickness of the epithelial layer is seen, some enlargement also of the papillæ, and a great development of the rete mucosum. Around the bases of the papillæ, and in the submucous and muscular tissues, there is a very abundant nuclear cell-growth. There is also a notable increase in the number and size of the blood-vessels in all parts. When the disease reaches the stage of epithelial cancer, the most striking feature is the development of the rete. It increases enormously at the expense of the papillæ, reducing them in many places to mere threads, and dipping down between them in the form of large club-shaped processes. Towards the termination of some of these processes the cells may be seen to have assumed a circular arrangement, forming the laminated capsules, or nests of cells, that are so characteristic of epithelioma. These points are illustrated by microscopical sections and drawings. Nine cases of ichthyosis linguæ are related at length, some of which were under the author's own care, while others have been communicated by friends or gleaned from publications. In an appendix eight more cases are briefly noticed. Several of the cases are illustrated by drawings. The paper concludes with some general remarks upon the disease and its treatment. 1. It is much more common in men than in women. Out of sixteen cases (one being set aside for special reasons) only one was a female. 2. It never occurs before puberty. It is an affection of early manhood and of middle age. 3. Though a venereal ulceration may occasionally be its starting-point, there is no reason to think that it is always associated with syphilis. On the contrary, it is clearly distinguished from the manifestations of that disease. 4. With regard to treatment: If the disease presents itself in a very early stage, it should be promptly and thoroughly excised. On the other hand, when it has become epitheliomatous, no time should be lost in performing an operation. But, during the whole middle period, the best thing that can be done for the patient is to study his general health. If any local measures are used, they should be of an unirritating kind. If any jagged teeth are present, they should be removed. At the same time the patient should be advised to guard his tongue against all sources of irritation, and to pay particular attention to his digestion. Under this treatment the ichthyotic coating often alters for the better, though it is never altogether removed.—*Report Royal Medical and Chirurgical Society, in Medical Times and Gazette.*

NECROSIS FROM PHOSPHORUS. By W. S. Savory, F.R.C.S., F.R.S.—Mr. Savory showed the upper and lower jaw-bones from a case of necrosis from phosphorus, and gave an account of the case. Mr. Beirkett thought this was the first time in which the whole of the lower jaw had been replaced. He referred to the case of a young child whom he saw many years ago suffering from cancrum oris. A part of the lower jaw exfoliated and the lost part was reproduced; the patient did well, and was now about thirty years old, and had a useful lower jaw. The fact which he had ascertained from Mr. Savory, that sensation remained in that part of the face supplied by the nerve passing through the mental foramen, was interesting. In the case to which he had referred, sensation was as perfect as before, though it could scarcely be believed that a piece of the jaw extending posteriorly to the mental foramen could be removed without injury to the nerve. Dr. Drysdale asked the cause of the patient's death; and if from the effects of phosphorus

what was the state of the viscera. Mr. Cooper Forster thought the case was worthy of a more detailed account. He asked how Mr. Savory had removed such large pieces of bone entire. The president asked if phosphorus-disease was as frequent now as formerly. About twenty-five years ago, he was engaged in an inquiry on this subject, and visited most of the match manufactories in the East-end of London. He found that the frequency of the disease was in direct proportion to the badness of the ventilation. In one manufactory where this was attended to, there was not one case. He remembered seeing one man who had himself removed his lower jaw by sawing it across in the middle. Mr. Savory said that the removal of the lower jaw was performed seven months after the first symptoms of mischief about the face. He divided the bone in the middle line, and each half was drawn out without force or hemorrhage. When the jaw was removed, there was no evidence of new bone; but a few weeks afterwards new bone was felt in the left angle. The boy was about eighteen, stunted, and appeared about fourteen; he was five feet high. He had been employed in Bryant and May's factory for five years. During the last two he had been employed in preparing the phosphorus paste, by heating over hot water phosphorus and gum, the mixture requiring to be kept constantly stirred. The following points were to be noticed: first, the extent of the necrosis, all the lower jaw and condyles, and both upper jaw and the adjacent bones, being involved; secondly, the very complete reproduction of the lower jaw in six months. On carefully examining the specimen, a normal periosteum was found in contact with the bone, so that probably it had been separated, and took part in the reforming of the bone. Then there were two teeth in the lower jaw, one of which was carious; all the teeth were in the upper jaw. The patient died of exhaustion from the great discharge.—*Royal Medical and Chirurgical Society Reports, in British Medical Journal.*

TREATMENT OF RANULA.—*The Doctor* says that in the case of a man, aged twenty-eight, who suffered from ranula so large as to cause a tumor the size of a hen's egg beneath the jaw, Dr. Betz determined to make use of Dr. Kyll's method, and to put a hair suture into the tumor in the mouth and bring it out in the neck. The mouth was frequently washed out with warm water. The patient was cured in about a year. Dr. Betz thinks that the opening of the fistula in the neck is certainly pleasanter for the patient than when it is made into the mouth. The chief point in this matter is not to take out the hair suture too soon, or relapse will take place.—*Medical and Surgical Reporter.*

RESTRAINT OF HEMORRHAGE DURING OPERATIONS ON THE MOUTH (*The Medical Examiner*, April 1st, 1874).—Dr. E. Andrews suggests that the troublesome and annoying hemorrhage which almost always attends operations on the mouth, and which is so difficult to control, can be effectually restrained by the use of an ether-spray apparatus. If the spray be directed upon the part to be operated on, the cold thus produced will thoroughly contract the vessels, and at the same time the general anæsthesia is kept up, the patient constantly inhaling the vapor. Dr. Andrews has performed uranoplasty in this manner with great freedom from annoyance.—*Philadelphia Medical Times.*

INTERESTING SPECIMEN OF EPULIS.—Dr. Bertolet exhibited a specimen of *epulis*, and said, "It is through the kindness of Dr. Thomas

Stellwagen that I am enabled to exhibit this tumor to the society. We have here a bicuspid, removed from the lower jaw, to which a fragment of the alveolar process is seen firmly united. The tooth was removed from a middle-aged lady, and with its extraction ended what had been, no doubt, a very bad toothache, for there is attached to it a pear-shaped, distinctly nodulated growth, which upon closer inspection is found to arise not from the tooth, but from the periosteum of the adherent bone.

"The tumor is half an inch in length, and measures a quarter of an inch in diameter at its widest part; it is covered with a dense capsule of connective tissue, which at a few points is beginning to undergo calcification. The interior of the growth is filled with a soft, reddish substance, throughout which an imperfectly radiating, denser substance can be seen by the unaided eye.

"The microscopic examination shows the structure to be composed of round nucleated cells, many seen as apparently free nuclei; there are also present numerous giant or myeloplaxic cells,—i.e. irregularly-shaped parent-cells of enormous size, containing each from five to twelve daughter-cells. Spindle-shaped cells are also seen; but the round-celled variety predominates. Of these appearances, the existence of the multinuclear giant-cells alone suffices to disclose the sarcomatous nature of the epulis. The fact that the so-called epulides belong to the class of sarcomata was first pointed out by Virchow. They are more frequently found upon the lower than upon the upper jaw, where they may attain, when not interfered with, quite a considerable size. It is seldom that these growths are seen at such an early period of their existence and removed with the same facility as happened in this instance. The interest attached to this specimen lies in the fact that although the tumor unquestionably starts from the periosteal layer of the bone, yet its growth has been inwards at the expense of the cancellous tissue, which has been partially absorbed, and a cavity formed, out of which the tumor is readily lifted. The base of the tumor being opposite the neck of the tooth, it becomes an easy matter to conceive how the less-resisting cancellated structure necessarily first yielded to the gradual expansion of the tumor, which was thus made to assume a position as though it were a central osteo-sarcomata, when in reality it pertains to the periosteum and not to the medullary portion of the bone. The presence of the multinuclear giant-cells does not in the least militate against the view of the periosteal origin of the tumor, since they are found in the periosseous as well as the intraosseous sarcomata of bones generally."—*Pathological Society of Philadelphia Reports, in Philadelphia Medical Times.*

ON TRANSPLANTING AND REPLACING TEETH.—Some months back a lad of fifteen years of age came to the dispensary of this town (Plymouth), afflicted with what is not an unfrequent cause of suffering.

The lad had some years since been struck in the face with a stone thrown by one of his comrades, and had both the upper central incisors broken. For some time they gave him no serious inconvenience. Recently, however, one of them began to trouble him. Inflammatory action was induced at the extremity of the fang, which latterly had resulted in an abscess.

The position of the teeth formed a regular arch; but the left lateral was crowded out and occupied a place behind the dental arch on the palate. It was the left incisor that was the present source of trouble,

and there was nothing to be done but to remove it. This I did; but as the lateral was a useless tooth and considerably out of the line, I determined to remove that also. It occurred to me that its transposition from its own socket to that of the alveolus of the central incisor was an object to be desired.

I have occasionally replaced a tooth that has been but slightly decayed, after it has been extracted, into its own alveolus; but to transfer a tooth from its own socket into another, as far as my experience tells me, has not been attempted.

In this case the lateral, being smaller in the size of its fang, could not fill the entire alveolus, and considerable doubt on my mind existed as to whether or not the tooth would become firm. And moreover, from its being placed in an alveolus in which considerable inflammation had previously existed, there was some reason to fear that still further irritation might be excited more serious, perhaps, than that for which I had to remove the tooth. This doubt was so much increased in my mind after I had extracted the tooth, that I seriously entertained the idea of abandoning the attempt.

The lateral, upon being extracted, was found to have an unusually long fang, which had moreover, from its irregular position, become distorted in its growth. So much was this the case that it was only by considerable pressure that I was enabled to place it in the alveolus of the central incisor sufficiently high up to bring the tooth within a moderately even line, so as to prevent it from appearing to be ridiculously long.

This, however, I did, and requested the lad to call upon me the day after, when I was glad to find there was no irritation of an unusual extent, and that the tooth was only bearably tender to the touch. A week after, and this tenderness subsided; and in one month's time, when I saw the patient again, the tooth had become so strong and firm that it would scarcely be credited that it had not always grown in its present position.

Fortunately, the lateral was an unusually large tooth, so that the intermediate spaces between it and the right incisor on the one side and the canine upon the other were not observably great.

I have models of the mouth, taken one before the operation and a second after the restoration.—*C. Spence Bate, F.R.S., in Transactions of Odontological Society of Great Britain.*

CASE IN DENTAL PRACTICE.—The following case occurred in my practice some time ago; and, as the issue was of such a successful nature, I forward it for insertion in the *Journal*:

Martha Morley, aged fourteen, stated that six weeks previously to my seeing her she had fearful pain in the first upper molar on the left side, which was followed by an offensive flavor in the mouth. Afterwards, her cheek, up to the eye, became very hard and lumpy; and next came a bright inflammation over the whole surface, as in erysipelas. This afterwards softened in the center, when a great quantity of pus formed, which next effected an opening in the skin and discharged itself in great quantities, with an offensive odor. At first the case was attended to by a druggist, until the pain and the extent of the inflammation and swelling, invading the eye, alarmed the family of her employer, and Dr. Nelson was consulted. He advised fomentations, poulticing, and a cooling aperient. This, with other treatment, was carried on until the

swelling and other local symptoms had subsided ; and, upon her first visit to me, I recommended the immediate removal of the tooth. This was more than two years ago, and there have been no further symptoms.

Had the tooth in the first instance been removed, the patient would have been spared a long period of suffering, and at the same time what I am afraid will remain a permanent scar in the cheek from the fistulous opening. I quote this case, not as being one of an unusual character, but to show how necessary it is in all such cases that a careful examination of the teeth should be made when symptoms so distressing present themselves.—*Adams Parker, in British Medical Journal.*

ANCHYLOSIS OF JAW: OPERATION.—Mr. Whitehead showed a girl, aged ten, upon whom he had operated for osseous ankylosis of the jaw. The patient had scarlet fever six years previously to her admission into the Royal Infirmary ; and on the second day of the fever an abscess formed behind and below the pinna of her right ear, which did not open for six weeks. The abscess was well in two weeks, but gradually the movements of the jaw became more and more retarded until the teeth became permanently closed, and she had to depend upon what food she could work between the edges of her lower teeth. An attempt was made under chloroform to force open the jaw by means of a couple of screw gags inserted after the extraction of some teeth. The jaw remaining immovable, an incision was made down to the bone, first on the right side and then on the left, across the neck of the condyles. The bone was sawn through, and the operation was completed by forcible fracture of the remainder. A false joint was soon established, and the girl, when shown, could open her mouth nearly to the full extent and perform all the functions of the jaw.—*Manchester Med. Soc. Rep., in British Medical Journal.*

DISLOCATION OF THE MAXILLARY.—At midnight, while all the world was asleep, and Nature herself appeared to be slumbering, I was roused, and called from the sweet arms of Morpheus, by the ringing of the door-bell. It was an old colored woman, who “waked up with a pain in her ears.” Finding it impossible to close her mouth, she called upon one of my neighbors, an M.D., who tried to reduce the dislocation, but succeeded only in mutilating her mouth by rough and ill-directed manipulations. Her gums and the angles of the mouth were bruised and torn. I found it a difficult task to reduce this dislocation. The poor woman’s mouth and face were so horribly bruised that I could not touch her without causing severe pain. I reduced it by using, *on the dislocated side only*, the thumb as a fulcrum and the chin as a lever. I shall not detail the indications to be fulfilled ; they are too simple and well known ; but I call particular attention to the diagnosis of these cases. Had my neighbor examined the case carefully, he would not have thought of using a thumb on each side. The usual four-tailed bandage was applied.—*E. A. Murphy, in Medical Investigator.*

TUMOR OF BOTH UPPER JAWS—painless, and of three years’ growth, in a man fifty-one years old. It involved the alveolar processes of both bones, extending from the second molar tooth of the right side around nearly to the same point on the left, and extending upwards nearly to the infra-orbital foramen. It presented a firm, nodular surface, pro-

jecting an inch or more into the mouth from the hard palate and alveolar surfaces, but did not extend into either antrum or the nasal cavities. A straight incision was made through the upper lip into the right nostril, and afterwards extended around the septum into the left; the cheek was dissected up on each side as high as the infra-orbital foramen, both second molar teeth extracted, and the soft palate divided transversely behind the tumor. The palate and alveolar processes were then sawn through upwards quite into the antra. The anterior wall of the antra and the nasal processes were detached by a few strokes with theallet and chisel, the vomer divided by bone-forceps, and the tumor easily depressed and removed. Two large mucous polypi, which filled the nasal fossæ posteriorly, and entirely independent of the tumor, were removed by polypus-forceps, the ligatures all cut short, and the flaps approximated by sutures.—*Massachusetts General Hospital Reports, in Boston Med. and Surg. Journal.*

SUBLINGUAL TUMOR,—alleged to be of ten years' growth, in a woman twenty-five years old. It increased gradually until six months ago; since then, it had progressed rapidly, and interfered seriously with eating and speaking. It was elastic, fluctuating, and presented a uniformly smooth surface, except where it was deeply adherent; the tongue was pushed up to the palate, and could not be seen when the mouth was opened at its widest. An incision was made through the mucous membrane and fascia covering the growth, which was then enucleated as far as possible by breaking down the lateral adhesions with a director; it was then dragged forwards and dissected from its deepest attachments, which extended nearly to the hyoid bone. The genio-hyo-glossus muscle of the left side laid over the tumor, and required partial division before its removal was effected. The tumor was an encysted one, as large as a duck's-egg, evidently congenital, and contained the ordinary sebaceous material, rolled into small balls, found in similar tumors, which not infrequently occur in this locality.—*Massachusetts General Hospital Reports, in Boston Med. and Surg. Journal.*

SUBLINGUAL TUMOR—in a man seventy-three years old; of gradual growth; unaccompanied with pain; one year's duration; the size of an English walnut; situated under the tongue; to be felt within the mouth, and from the outside in the submaxillary triangle. From the probability of troublesome hemorrhage, it was thought judicious to attack the tumor from the outside. This was done by a curved incision just above the digastric muscle, through the skin and platysma; the facial artery and anterior jugular vein were tied, cut, and turned one side to make room for the deeper dissection; the submaxillary gland was raised and the deep fascia opened. The operator then passed his finger into the mouth and pressed the tumor down; it was seized with double-hook forceps, the deeper attachments cautiously divided, and its removal accomplished. Under the microscope, the growth proved to be a lympho-sarcoma.—*Massachusetts General Hospital Reports, in Boston Medical and Surgical Journal.*

TUMORS NEAR THE SALIVARY DUCTS.—Patrick McLoughlin, æt. twelve, was admitted April 11th, for a swelling in the right cheek as large as an orange, which had been growing for two years. It filled the space in front of the masseter muscle, and projected equally towards the skin and mucous membrane. The orifice of Steno's duct was pervious, a

fact which did not oppose the opinion of some surgeons that the tumor was cystic, like ranula, for that disease is not a distention and obstruction of the salivary duct. When the tumor was pushed forcibly outwards by the fingers introduced into the mouth, its edge was slightly lobulated, and it therefore appeared to be a very soft, fatty mass. In order to avoid external scar and wounding of any of the radiating branches of the facial nerve, the tumor was removed by a vertical incision through the mucous membrane and buccinator muscle, about one and a half inches behind the angle of the mouth. The space rapidly filled up, and in a week the boy left the hospital, no deformity remaining.

On the same morning, a well-marked case of ranula presented itself, in which the openings of both Whartonian ducts were free and apparent under the tongue. The tumor was clearly a distention of a mucous follicle, its opening being obstructed. Dr. Mapother introduced a seton, having found that plan of treatment very successful.—*St. Vincent's Hospital Reports, in Medical Press.*

DEFORMITY OF MOUTH—in a middle-aged woman, caused by salivation following accidental administration of calomel some months since. This had resulted in a loss of the teeth and of the alveolar border of the lower jaw; and in an ulceration so extensive that the subsequent cicatrization had tied the lower lip and tongue down to the lower jaw. The saliva constantly dribbled from the corner of the mouth, and eating and speaking were seriously interfered with. The lip was freely dissected away from the cicatrix and jaw, and, by means of a lozenge-shaped incision, the most prominent portion of the cicatrix was excised. The tongue was then loosened, so that the tip could be made to touch the roof of the mouth. The two sides of the incised lower lip were then carefully adjusted and secured in apposition by sutures.—*Massachusetts General Hospital Reports, in Boston Med. and Surg. Journ.*

MECHANICAL SUPPORT IN FACIAL PARALYSIS.—An instrument has been invented for supporting the affected muscles of the face in cases of facial paralysis. It consists of a silver wire bent so that one end enters the buccal cavity at the angle of the mouth, the other end being fixed above and behind the ear.—*Boston Med. and Surg. Journal.*

DEATH FROM LANCING OF THE GUM.—In the *American Medical Journal*, for April, are given the particulars of the death of a child, fourteen months old, from hemorrhage occasioned by the lancing of the gum over a molar tooth. The blood oozed from the divided gum for three days, in spite of all efforts to suppress it. The child was well developed, and healthy from birth, and no previous suspicions had been entertained of the existence of a hemorrhagic diathesis.—*Boston Med. and Surg. Journal.*

VULCANIZABLE GUTTA-PERCHA A FAILURE.—In the *Missouri Dental Journal* for February, 1874, is a communication from W. H. Barker in reference to vulcanizable gutta-percha. After highly commending the article in other respects, he says, "As to its durability there is not the slightest doubt, and none need fear it on this account." At another point he says those in whose hands it has failed are at fault in not pointing out their failures, that others might avoid them.

Having been among the first to use gutta-percha, my experience as
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to its durability equals, perhaps, that of any. I find that a little over a year will do the business for about twenty-five out of fifty sets, unless made so thick and clumsy as to be very undesirable for a base for artificial teeth. I find that they have broken in about this proportion somewhere or somehow in that time, and I expect the rest to return *hors de combat* within another year. This I must admit as true after having as high hopes of the utility of gutta-percha as a substitute for rubber as any one. In working the material I tried, and successfully, as I supposed for awhile, all the suggestions that appeared in the dental journals on the subject, but unless much improved I do not expect to use it again except for an occasional temporary full denture. It is still less fit for partial than full sets. If the plate does not extend further than the palatine surfaces of the teeth, and is not two or three times as thick as rubber need be, hot coffee or tea will soften it so that it will not retain its place, although the fit may be excellent when cool. Sometimes the natural warmth of the mouth will cause them to collapse. If others have had as extended experience and better results, I should like to possess the secret of their success, as I believe gutta-percha to be much easier worked than rubber can be, and equal in all respects except as above set forth.—*W. E. Driscoll, in Missouri Dental Journal.*

A USEFUL DENTIFRICE.—Dr. D. H. L. Hogg, of Texas, writes us that he has found liquor calcis (water of lime) very useful as a mouth-wash. It improves the gums and prevents the toothache. He has used it in private practice and personally.—*Medical and Surgical Reporter.*

PRESERVING IRON AND STEEL SURFACES FROM RUST.—A varnish for this purpose may be made of 120 parts resin, 180 sandarac, 50 gum lac. They should be heated gradually until melted and thoroughly mixed, then 120 parts turpentine added, and subsequently, after further heating, 180 parts rectified alcohol. After careful filtration, it should be put into tightly-corked bottles.—*Journal of Applied Chemistry.*

TO CEMENT BRASS TO GLASS.—Boil three parts of colophony with one of caustic soda and five of water. The soap or emulsion produced is mixed with half its weight of plaster Paris, zinc white, white lead, or prepared chalk.—*Journal of Applied Chemistry.*

TO SOLDER BROKEN FILES.—After cleaning the surface with chloride of tin, employ ordinary tinkers' solder, applied by the aid of a blowpipe and alcohol or gas flame.—*Journal of Applied Chemistry.*

HINTS AND QUERIES.

WHAT is the best means of removing wax from the fingers?—X.

WILL some one have the kindness to explain his way of securing the upper front teeth till they become solid after replantation?—H. E. W.

WILL some one explain the meaning of the term *Leptothrix Buccalis*?—P.

Leptothrix.—Hairlike, or having the fineness of hair. *Buccal.*—That which concerns the mouth and principally the cheek. *Leptothrix Buccalis.*—A microscopic parasitic plant, developed in some forms of aphthous inflammation, but detected also in the buccal secretions of healthy persons.

Weights of the Metrical or French System.

One Myriagramme = 10,000 Grammes.

" Kilogramme = 1,000 "

" Hectogramme = 100 "

" Decagramme = 10 "

" Gramme = the weight of a cubic Centimetre of water at 4° C.

" Decigramme = the tenth part of one Gramme, or 0.1 Gramme.

" Centigramme = the hundredth part of one " " 0.01 "

" Milligramme = the thousandth " " " 0.001 "

Relation of Metrical Weights to Weights of the U. S. Pharmacopœia.

Metrical Weights.	Approximate equivalents in Grains.
One Milligramme	= $\frac{1}{5}$
" Centigramme	= $\frac{1}{2}$
" Decigramme	= $1\frac{1}{2}$
" Gramme	= gr. xv
" Decagramme	= ʒiiss
" Hectogramme	= $\text{ʒiii} \text{ʒv}$
" Kilogramme	= $\text{lbij} \text{ʒvii}$
" Myriagramme	= $\left\{ \begin{array}{l} \text{lbxxvi} \\ \text{ʒix} \text{ʒiv} \end{array} \right.$

HOLES IN RUBBER DAM.—In the *Cosmos* for May there is a communication from Dr. Babcock on the rubber dam punch. Inclosed, I submit for your approval a piece of dam perforated with the punch supplied by S. S. White, making a clean cut, and at the other end a perforation made by a red-hot excavator, which makes a rough edge. This kind of edge I find will stretch as far as a cut one, and is not so liable to slide off the crown while operating, and, from examination, is more impervious to the fluids than the cut edge.

The perforation is made with a taper-pointed excavator, the dam being laid on a cork. After the perforation is made, you will notice the edge is thicker than any other part of it.—I. CALDER, *Santa Barbara, Cal.*

PUNCHING HOLES IN RUBBER DAM.—I noticed an article in your May number of *DENTAL COSMOS* about punching holes in rubber dam, which to me seems complicated. I will give my method. Take a common cherry-drill, now take your rubber dam, select your spot for a hole, and punch without regard to slack of rubber. You will be satisfied with the result.—D. J. POLLOCK.

PLUGGING PULP-CAVITIES OR CANALS.—The remedy for a disease is often extremely simple, its efficiency consisting in its being the right thing in the right place. Creditable as the efforts of the past have been in the direction of plugging pulp-canals, have we reason to be entirely satisfied with any one of the many materials employed for this purpose? After the space previously occupied by the pulp becomes hermetically sealed by a material indestructible, immovable, and devoid of corrosive qualities, we no longer look for disease associated with the internal structure of the tooth. We will accept this as a fact. Supposing, then, the pulp-cavity to be free from all disorganized materials, and our instrument-case well supplied with perfectly smooth, flexible broaches of various sizes, and platinum wire of similar varieties, we thus proceed. Having selected a broach that will glide easily to the apex of the root-canal, yet its walls embrace the point of the instrument, we obtain the desired length, and mark it by means of a thread tied round the broach, then withdraw it and select a wire of the

right length and size, shape the cut extremity so that it may wedge itself into the canal, roughen it by means of a coarse separating file, twist some fibers of cotton loosely round the upper half, then dip the wire and cotton into os-artificial of the consistence of cream, and force it to the desired position.

There are many advantages in this mode of procedure. First, the yielding quality of the wire allows its adaptation to the most complex curvatures; second, we have a reasonable assurance of having filled the entire passage; third, any desired length of the wire may remain to aid in retaining the crown-cavity filling; fourth, in case of abscesses, it is much easier and less painful to the patient to withdraw a simple wire than to remove a gold plug packed to the apex.—H. F. L.

A NEW USE FOR CARVACROL.—I wish to call attention to the action of carvacrol upon gutta-percha. By placing a drop or two of carvacrol upon a glass or porcelain slab and adding a few pieces of heated gutta-percha, the latter will be softened and rendered plastic, in which condition it will remain until the carvacrol is evaporated or is absorbed by bibulous paper.

If a cavity in a tooth be thoroughly moistened with carvacrol and warm gutta-percha then introduced, the effect will be the same. Gutta-percha kept in solution with carvacrol will be found the most convenient preparation extant for filling pulp-canals; it will retain its liquid condition as long as desired, will not shrink in hardening, and does not cause any irritation at the extremity of the root. Canals which are narrow or curved can be filled perfectly with it.

In filling over an exposed pulp, the gutta-percha should be introduced in a semi-fluid state and in small quantities, covering the point of exposure, when the surplus carvacrol should be absorbed with bibulous paper, thus leaving the pulp protected during the rest of the operation. Either pink or white gutta-percha can be used.—A. L. NORTROP.

MOISTURE-TIGHT PLUGS.—On reading the statement of Thomas Fletcher on the "Unexpected Property of Adhesive Gold," published in the *Cosmos* of April, 1874, I chose two teeth,—a molar and a central incisor,—filled them with adhesive gold (Globe foil), packing it well with a Salmon's automatic plugger. I then immersed them in ink for five days; at the end of that time the fillings were removed, and the cavities were found to be as free from all stain of ink as when filled. I claim that an adhesive gold filling can be made moisture-proof without any extra trouble.—O. W. JUDD, *Westboro', Mass.*

"AN UNEXPECTED PROPERTY OF ADHESIVE GOLD."—The article under the above caption, which appeared in the April number of the *DENTAL COSMOS*, seems to demand consideration and the expression of the experience of others. My work has been mostly in the line of adhesive gold, and the thought of having given so much labor to the adaptation of gold to the walls and borders of cavities, and then to be informed that, "when a cavity has two open sides, it is simply a total impossibility, except with amalgam," to make a moisture-proof filling, and that "the majority of plugs inserted by the best operators, under ordinary circumstances, are not perfectly moisture-proof, and that an adhesive plug never is so under any possible circumstances," are statements to which I cannot subscribe. This is a question which should be investigated, and for one I am glad it has come up. Unexpectedly, I have had my opinion verified in reference to the value of adhesive gold fillings. I filled an approximal cavity in the right lateral incisor of a young lady patient, requiring about two leaves of No. 5 foil. The cavity extended well up under the gum, and down to about the twelfth of an inch of the cutting edge; palatine wall two-thirds gone, labial wall one-third gone, and almost an exposure of pulp. Not having time to completely finish the filling on

the same evening, the patient was discharged, and requested to return in four days, at which time she came with the complaint that she had experienced pain in the tooth. I divined the cause, and the thought occurred to me that the removal of the filling should serve me two purposes. Accordingly the tooth was surrounded with a napkin, and its entire surface wiped dry up to the gum. I then carefully drilled out the filling and noted the inside of the cavity. The entire base and walls, with the exception of a very slight portion of the margin of the palatine wall in close proximity to the gum, seemed to be as dry as could be, and the powdered dentine made by cutting anchorages, a few specks of which remained in the cavity when filled, might have been blown away like dust. I did not consider the filling a very good one when inserted, particularly at the margin where the moisture occurred, and was fully satisfied in my own mind that I could have done better work if I had been favored with a better light. The dryness referred to could not have been the result of heat produced by boring into the filling, as precaution was taken to prevent such action. I since inserted a filling of medium size into a tooth recently extracted, placed it in a bottle of black ink, allowed it to remain about two days and a half, then took it out and removed the filling, when the cavity showed no signs of the fluid having penetrated between the walls and the filling.

Another assertion in the same article should be noticed, and one which my experience of nine years' practice will not for a moment allow me to indorse, "that a plug perfectly tight against moisture is a certain protection against further decay, under every and any condition and in every mouth." I have seen cases which I had reason to believe were filled in the best manner with amalgam, but probably from imperfect organization of the tooth-structure or constitutional cause, decay went on, leaving the fillings loose and shaky.—C. N. BOARDMAN, *Minneapolis, Minn.*

AMALGAM.—In reading the *Cosmos* from month to month, I am struck with the diversity of opinion which exists in regard to the use of amalgam and the extreme views entertained by different writers on that subject. Take, for example, an article by J. Payne, D.D.S., in a recent number, in which the writer condemns it in the strongest terms, and ridiculously suggests the idea of legislative enactment, that practitioners using it may be subjected to punishment by law. That amalgam in the hands of ignorant and unprincipled practitioners has been the cause of much evil cannot be gainsaid; but I maintain that it is equally true that by proper manipulation of the material and discrimination in its use, there are cases where it may be employed with the most satisfactory results to both patient and practitioner. In the spring of 1870, I had a left superior molar filled with amalgam, being satisfied that it would not sustain the pressure requisite for the introduction of gold. I have never experienced any ill effects, and to all appearances the tooth will do good service for years. In my opinion, gold should be employed when it is at all practicable; but in such a case as I have mentioned, where the tooth will not bear the introduction of gold, I choose the lesser of two evils at least, and fill with amalgam rather than extract it. In the month of January, a patient called at our office suffering from odontalgia. I noticed that the superior central and lateral incisors presented a black appearance, and upon examination found that nearly all the approximal surfaces had been filled with amalgam. The man who performed the operation was prompted by pecuniary motives, or was ignorant of his business. And still, if we are to condemn an article simply because quacks see fit to abuse and misapply, we will soon find our profession retrograding rather than advancing. Let us be more conservative

in our views ; and yet, after having formed the most deliberate convictions, be open to impressions that may present themselves to our better judgment.—GEORGE OSBURN.

SALIVARY CALCULUS.—I lately had a very curious and interesting case under treatment as to the situation of a deposit of salivary calculus. The patient was a man about forty-five years of age, and was remarkably strong and robust. He called to consult me in regard to his left upper wisdom-tooth, which upon investigation I found to be dead and having the crown partially broken away. The second molar appeared sound, but was painful when pressed upon with an instrument.

On a still closer examination, I discovered a large deposit of salivary calculus, apparently attached to the gum, which was entirely covered by the muscles of the cheeks, and was not seen at first. This extended from the opening of Steno's duct backward fully two-thirds of an inch. Below this, toward the neck of the teeth, the gum remained seemingly in a perfectly healthy condition for a space of half an inch.

Indeed, so high was the deposit, and altogether separated from the surface of the teeth by this portion of gum, that I at first was at a loss to understand what it was, or how it was held in its place. Upon pressing the tooth with an instrument, I noticed that the deposit above moved also, and concluded that the roots must be exposed beneath. After removing this deposit, which was as large as an ordinary chestnut, I found that the apices of the buccal roots of the second molar and wisdom teeth were exposed to view. The alveolar process was absorbed, leaving nothing exterior to the roots below but the gum. I extracted the teeth and found the roots were all decomposed, being brittle, like chalk.

The only explanation I can give about this case is, that the teeth had probably ulcerated, and having been allowed to remain in the mouth, the alveolus had been completely destroyed, leaving the roots of the teeth exposed, thus affording a formation for the deposit of calculus. It seemed very remarkable to me, however, that the gum should remain so healthy below the deposit.—CHAS. M. HOWE, D.D.S.

DENTAL PLASTER.—Some time ago I opened a fresh box of rubber, and immediately began to have trouble with my plates. Set after set came out with the rubber warped or drawn away from the teeth, so as to leave unsightly gaps along the line of juncture. The defect was less noticeable in some cases than in others ; but no set came out entirely free from it. This surprised me not a little, for I had long used this kind of rubber ; it was White's No. 1, and had never experienced a similar difficulty. Still, as I detected, or fancied I detected, a difference in the "working" qualities of this package as compared with previous lots, I concluded that the manufacturers had been trying to improve their gum, and had met with a worse than failure. So I returned the box, with a complaint to the dealer, and ordered another kind. But, to my surprise and disappointment, this worked no better than the first, and I began to despair of ever again making a decent set of teeth. My continued ill success, however, led me to doubt whether the fault was with the rubber at all, and then I remembered that at the time I had purchased my first box I had also obtained a fresh supply of *plaster*. This put me on a new scent, which proved to be the right one. Another lot of plaster was procured, and my trouble ceased at once and entirely.

A year or two ago, Dr. Codman remarked, in the *DENTAL COSMOS*, that our reputations are in the hands of the gold-beater. The experience given above would seem to indicate that they are in the hands of the plaster-maker as well.

What the objectionable quality in this particular sample was, or how it could have been avoided in the manufacture, I do not know. It was a plaster that set quickly, and was inclined to be lumpy.—M.

DENTAL SUGGESTIONS.—A good way of testing the amiability of a dentist is to present him one of his last cases for inspection, which “broke in the hand simply by washing.” Rubber sometimes cuts mysterious pranks.

This suggests the importance of knowing that the rubber we use is the best in the market. To this end procure a variety of specimens, cut into strips and vulcanize between plate-glass, interposing any convenient substance to keep the glasses separated, so that the rubber will be of the required thickness when done. Nipping off pieces of these with pliers is an easy way of testing the strength of the strips; but, if accuracy is desired, the strips should be of equal thickness and breadth, and fastened firmly in a horizontal direction, and weights suspended at a chosen equal distance from the place of fastening,—the strips requiring the greatest weight to fracture being the best.

Some of the much-lauded foreign varieties are little stronger than pipe-clay.

A good instrument to hold engine-burs may be made by trimming out nicely the lid of a sardine-box and introducing two pounds of fine shot. The burs stuck into the shot are held down firmly by the weight of the shot, and are not easily tipped over. No glass cover is needed, as it is only in the way.—JOHN D. WINGATE, *Carbondale, Pa.*

EXPERIENCES WITH CELLULOID.—In the early part of last year, I concluded that I would use celluloid in my practice, so I bought an oil apparatus, and with the printed instructions before me went to work. The result was that, after wasting a week in making a series of utter failures, I threw the whole aside in disgust, with the conclusion that celluloid was totally unreliable as a base for artificial teeth.

But, on the occasion of the visit of Mr. Hyatt to Washington last winter, my attention was again called to it, and on the kind invitation of a gentleman of our profession, who has been using this material with great satisfaction for two or three years, I visited his laboratory and witnessed his manipulation. I then found that my failure of last year was *my fault, not that of the celluloid*. Becoming deeply interested, I have, during the last four or five months, devoted all my spare time to studying its nature and experimenting as to its behavior, and I have been astonished at the development of its qualities and capabilities when properly managed.

I propose to give briefly in this communication my conclusions as to its fitness and value as a material for dental purposes. At some future time, when I shall have completed some further experiments, I will be able to say more about the best method of manipulating and the reasons therefor. On this latter point, I will only say that in every stage it requires to be *treated kindly*. For instance, after the flask has been partly screwed down (and while the temperature is yet below 250°), it should be removed from the oil and taken apart to see if the material is going where it is wanted; if not, in its then soft state it can be bent and pointed and directed just wherever it should go; thus doing by coaxing what no amount of rough treatment or force could accomplish. We put up a most difficult case last night, in which we found it necessary to remove the flask and take it apart three or four times, in order to *coax* the material to the proper places. If the manipulation is properly conducted, the celluloid can be made to go anywhere and do anything that is required for dental purposes, and when, at the completion of the process, the plate is taken out of the plaster, it will be found

to have copied with perfect accuracy every inequality of the palatine arch and to have filled the mould completely to its minutest point.

When compared with other plastic materials now in use, it is unequaled by any of them in its strength and toughness, in its susceptibility to a fine finish, in its close resemblance, when tested by sight and touch, to the natural tissues, and, on account of its peculiar properties, in its application to regulating cases. Finally, if properly managed, it will not warp or change its shape under any of the ordinary circumstances attending the wearing of artificial teeth. This has been established in three years' use of it by a dentist in this city.—R. FINLEY HUNT, 2142 Penn. Av., Washington, D. C.

CELLULOID BASE.—Having now used this base exclusively for two and a half years for artificial teeth, we feel that perhaps our mode of using it may be of benefit to the profession. Give celluloid as patient and thorough a trial as you did rubber in its early days, and you will have all the satisfaction in its use that you ever had with rubber. The company are now making a better quality of the celluloid base than they have ever before made; and with the new steam apparatus, the best results may be expected if you do a good job and according to their directions. Whether in oil or steam, commence to put the job together as soon as the material will give a little, and slowly put down the screw every half minute or so—not driving too far at once—till it is firmly together; then let the case stand in the oil or steam for an hour at least before taking it out; then let the case stand, preferably in water, till it is cold, before you take the teeth from the plaster or open. This will be about two hours or so; or, if towards night, to let it stand all night will be first-rate. You will have no springing or warping, more than with rubber. Don't relieve the case from pressure till cold, as the steam may be let off, or the case taken from the oil without doing so. Now finish up as you do rubber, being careful not to heat the plate in polishing, and instruct your patients to keep them out of *hot water*. We have had a more general satisfaction than we ever had with rubber or any other substitute for gold or platina. The first year we used it we had a rubber license, but preferred the celluloid base with all its then imperfections to rubber, and shall use nothing but celluloid base as long as the company gives us good plates as they now do. They are using every means to perfect the base, and are always willing to receive and adopt any suggestions from the profession that seems to promise any improvements. We say, Try again, and be faithful and careful, and do not be too fast or too slow in your efforts to get accustomed to its use, and you will succeed. We prefer it in every respect to rubber, and find that it does not injure the mouth, as it has no deleterious properties about it as rubber has, and as thousands of mouths show.—RISING & ANDREWS.

A SUGGESTION IN REGARD TO THE USE OF CELLULOID.—Dr. Daigneau, of Charlestown, Mass., has used celluloid about two years, and to the usual manipulation he adds the following:

After packing and closing the flask, he places it in his stove-oven and keeps it there about an hour and a half, at a heat sufficient to bake bread, thus expelling anything that might be evaporated from the plate.

Dr. Daigneau says that by this method he has overcome all tendency to shrinkage and consequent warping and retraction from the teeth.

This method seems to be reasonable in theory, and being indorsed after long trial by a sound practical man, I thought it worthy of being brought to the attention of the profession.—J. LITTLEFIELD, Boston, Mass.

THE DENTAL COSMOS.

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ORIGINAL COMMUNICATIONS.

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 400.)

THE REGION OF THE TONGUE.—*Continued.*

(b) *Those diseases appearing in the submucous or muscular tissues.* This, although surgically an important subject, is restricted in localization to the *fibrous tumor*, *syphilitic gumma*, and the *tubercular deposit*. Fibrous tumor presents no anatomical feature of interest. *Syphilitic gumma*, according to Cooke,* generally appears in the center of the organ, whilst cancer has its usual primary seat at one side. With reference to that rare disease, *tubercular deposit*, we can confirm the statement of Paget,† that it affects the lateral surfaces mainly.

(c) *The diseases of the anterior two-thirds of the dorsum as contrasted with the posterior third.*

The vallate papillæ divide the tongue into two natural regions, that in front receiving the lingual nerve, and that behind the glosso-pharyngeal. That in front is covered by a derm-like involucre closely held to the muscle; that behind is loosely covered with its thin, smooth mucous membrane; that in front lies within the mouth, and is almost without glands; that behind lies within the pharynx, and is rich in glands.

We have already seen that cancer begins at the anterior division of the tongue. Now, when the disease is wide-spread, it is observed that it tends to involve parts directly beneath its nidus, then only to pass beyond the vallate papillæ. The reason of this is made clear when we recall the disposition of the *lymphatics*. These are numerous on the dorsum of the tongue, and are especially so, according to Sappey, until the line of the vallate papillæ is reached, when they abruptly cease, and a few only pass thence to the pharyngeal portion. The bulk of them are known to form on either side a main vessel of descent, which passes

* Cancer and its Allies.

† Med. Times and Gazette, 1868.

vertically through the muscular structure, and joins its special gland near the anterior belly of the digastric muscle. It is not to be inferred from the above that malignant disease may not involve the pharyngeal region from in front, though its most conspicuous involvements are as stated. The following is an instance of the passage of diseased action beyond the usual barrier. Hilton* divided the lingual nerve for the relief of pain accompanying carcinoma of the tongue. The relief was permanent, so far as the nerve was concerned; but when the disease invaded the area of the glosso-pharyngeal nerve the pain recurred.

The presence of large numbers of glands in the pharyngeal portion of the tongue would lead the student to infer that distinct glandular lesions would be often detected. These are, however, rare. And even in those examples of cystic disease which have been recorded, no mention is made by writers of the strictly local character our knowledge of anatomy would infer this disease to assume. It is, however, in every way likely that a cyst forming at the base of the tongue would find less resistance toward the fatty center of the "medulla" of the tongue than it would toward the pharyngeal contour,—a view which would harmonize with Salter's observation, that the branches of the follicle are often lodged in the parenchyma fully one-half to three-quarters of an inch from the orifice of the gland. That the glands at the basal third of the tongue are productive of a free secretion of thick mucus is evident. The following case is given in exemplification of this fact, and also to show how long sustained pressure can be borne in a locality noted for its resistance to slight intrusions. A male, aged sixty, had for three months secretion of abundance of tenacious mucus from the pharynx, with hacking cough and some dysphagia. He occasionally vomited after taking food. After many attempts to relieve the symptoms, the patient applied for relief to Sir James Paget, who extracted from the base of the pharynx (indeed, resting directly upon the base of the tongue) an upper set of artificial teeth.† Fibrous tumors are of rare appearance, but tend to be developed toward the pharyngeal portion. Dr. W. Hunt, of Philadelphia, operated on a girl of sixteen years, the basal portion of whose tongue was entirely occupied by a large fibrous tumor. The patient died suddenly, on the third day.

Inflammation.—This in the tongue is rarely an idiopathic affection. It may follow the bite of a serpent or sting of an insect. It is remarkable for the rapidity and extent of the infiltration, a feature which is at once explained by our knowledge of the character of the medulla. The danger from pressure of the mass against the larynx demands free superficial incision. It has been happily said by Holme

* Proc. Medico-Chir. Soc., 1862.

† Med. Times and Gazette, January 18, 1862, 59.

Coote,* that these incisions should be made exactly on the dorsum, "for œdema may so far involve only one side of the tongue as to cause the lower surface, which yields the more readily, to be turned directly upward. Mr. Wormald, in observing this condition, found that, upon the subsidence of the swelling, the incision made above gradually acquired a directly inferior position."

The tongue is singularly free from liabilities of invasion of diseased action from other organs. The superficies of the face may be literally destroyed by cancer, the jaws involved, and yet the tongue will remain not only free from disease, but not even dried or furred. The palate and uvula may be destroyed by syphilitic disease, which will not on that account descend to the tongue; although in these cases the tongue will become dry.

Abscess, as may be expected, may occasionally form in the loose "medullary" tissue, and make little external manifestation. The "cortex" must be divided before the pus escapes. The so-called strumous ulcer of the tongue would appear to be simply the result of the breaking down of a diffused inflammation. It differs, therefore, says Paget,† from both syphilis and cancer, "by the ulceration being always preceded by distinct suppuration. The induration that accompanies or precedes the ulcer is never intense or well defined; it is rather a toughness with diffuse enlargement." *Sloughing*, on the other hand, is almost unknown in syphilis, while it is a frequent attendant upon cancer in this situation. On the whole, notwithstanding the number of nerves and the size of the arteries supplying the tongue, destructive results of inflammation are singularly rare. Indeed, the organ is passive to many kinds of lesion. There is on record‡ a curious example of the crown of the second molar tooth being lodged in the tongue thirty-two years. The patient had been a soldier in the Napoleonic wars, and had been wounded in the face. Hyrtl mentions somewhat similar cases where musket-balls have been so retained.

Wounds of the tongue would be of easy occurrence were the organ not so well protected. Hyrtl§ has described an instance of severe wound of the tongue in a butcher-boy, who, while holding a knife edge inward between his teeth, was run against. In children who, by falling, or in epileptics, who wound the tongue with their teeth, it frequently becomes necessary to reunite the lips of the wound. This, owing to the extreme softness of the tissue, is exceedingly difficult to accomplish, particularly with the young. We have to our cost known

* Holmes's Sys. of Surg., iii. 901.

† Loc. cit.

‡ Amer. Journ. of Med. Sci., April, 1846, 503.

§ Topog. Anatomie, i. 409.

what it is to place interrupted sutures in a wound of the tongue only to have them cut themselves out. Vincent* long ago pointed out the proper way to treat this lesion. He advises to keep the patient's tongue quiet by placing a bandage about the jaws. This places the tongue at rest between the sides of the lower jaw, the lips of the wound being thus adjusted by the lateral pressure.

The following cases are entirely exceptional.

(1) A boy, while sitting on the shaft of a wagon, was jerked off, and his face crushed by one of the wheels. He received a compound fracture of the inferior maxilla, and the edge of the bone, turning inwards, completely amputated the tongue at its base, with the exception of a few shreds of tissue.†

(2) A sailor, while smoking, fell. His pipe was driven into his tongue and broken; suppurative glossitis ensued, and, after extraction of the fragment of pipe-stem, almost instant death followed, by hemorrhage from the left internal carotid artery, which had been transfixed by the missile.‡

Errors of Nutrition.—Hypertrophy of the tongue is one of the most marked tendencies of this organ. The condition may be congenital, as noted by Dr. Thomas Harris§ in a lad of nineteen. The organ, in this case, measured six inches, and projected three inches from the mouth. Such a mass must pull the hyoid apparatus upward and forward, and, by exerting constant pressure upon the alveoli of the incisor teeth, will push them forward.||

Atrophy of the tongue, without pressure or lesion of the trunk of the hypoglossal nerve, is rare. Dupuytren's famous case¶ of paralysis of the left hypoglossal nerve with atrophy of the corresponding side of the organ, exhibited the feature which we are prepared to learn of being confined entirely to the oral division of the organ. Death ensued at the end of two years. At the autopsy, it was discovered that of a mass of hydatids lying in the cerebellar fossa, one had intruded itself into the anterior condyloid foramen and compressed the hypoglossal nerve. Paget** has reported a similar case of pressure of the nerve from a piece of dead bone near the anterior condyloid foramen. Removal of the fragment resulted in recovery.

We have recognized unilateral atrophy, the result of traumatic division of the hypoglossal nerve. A female, aged twenty years, had an abscess under the left side of the lower jaw. The physician employed at the time opened it, and in so doing must have divided the nerve; for,

* Obs. on Surgical Practice, 1847, 118.

† Lancet, ii. 1864, 631.

‡ Ibid., 1837.

§ Am. Journ. Med. Sci., xx., old series, 15.

|| For other cases, with bibliography, see Humphry, Med.-Chir. Trans., xxxvi.

114.

¶ Leçons Oral, i. 493.

** Trans. Clin. Soc., iii. 238.

from that time, a deflection and atrophy of the corresponding half of the organ was observed. When seen twenty-five years afterward, the tongue was found deflected and atrophied. The affected side was fissured extensively transversely. W. Fairlie Clark* has detailed a case in which a patient suffering from carcinoma of the breast exhibited atrophy of the right half of the tongue, confined to the anterior two-thirds of the organ.

The following is an example of unilateral paralysis followed by sloughing. A male, aged seventy-eight years, suffered from a neuralgic affection of the occiput. He at the same time complained of dysphagia, and excessive flow of saliva. By the eighteenth day the tongue became flabby, insensible, and began to mortify. By the thirty-first day, a line of demarkation was formed, which included the entire right half of the tongue and the tip of the left. The patient recovered.†

The Alveolo-lingual Groove.—When the tongue is at rest, there lies between it and the gum of the lower jaw a groove, which has a variable size, according to the position of the tongue. Beneath the tip of the tongue this space is incompletely divided by the lingual frænum. The base of the groove is distinguished by its whitish color, and has commonly upon its surfaces a vein whose thickest portion is directed from behind. Beneath it lies the mylo-hyoid muscle, which here, from its analogy with the buccinator and constrictor muscles, may be considered a submucous structure. The mucous membrane, however, is but loosely united to it. The groove is marked on either side by a fimbriated line answering to the position of the sublingual glands. Beneath the tongue on either side of the frænum is seen the opening of the duct of the submaxillary gland, which forms for itself a little elevation, which has been called the sublingual caruncle. The alveo-lingual groove is best developed in the negro.

Among the diseased conditions affecting the groove may be mentioned (1) those pressing upon it from without, as in the deformation following fibrous and other tumors; and (2) those arising from the base of the groove, either from the jaw or through pressure exerted from the supra-hyoid space upward. Conspicuous among the former are *foreign bodies* and *calculi* of the duct of Wharton. Of the first of these, pins incautiously held in the mouth have been known to slip head foremost into the duct, and require slitting of the parts to remove them. Calculi of the duct are occasionally met with, which from their peculiar position may give rise to symptoms of suffocation. Mr. Jessop‡ mentions a case in a male, aged twenty-four, in which the calculi had been noticed in the

* Med.-Chir. Trans., xxxvii., 1872, 91.

† Dr. E. Ballard, Med. Times and Gazette, March, 1869, 296.

‡ Br. Med. Journ., 1871, 120.

mouth for a year. Suddenly a swelling made its appearance, which so rapidly increased in size as to form by the fourth day a mass as large as a hen's-egg in the alveolo-lingual groove. The patient suffered pain in the neck, and had difficulty in breathing and swallowing. Two calculi, each the size of a pea, were removed from the right submaxillary gland, when a gush of retained saliva followed, and the symptoms subsided.

The other conspicuous lesion is *cystic tumor*, to say nothing here of the *fatty tumor*, which is rare. Cystic tumor in this position has long had the reputation of being the result of obstruction of the duct of Wharton. But recent writers have more than suspected the validity of this claim. In 1854, Dr. C. D. Weber* definitely proved that the chief locality for cystic tumor is not in the duct of Wharton, but the synovial sac described by Fleishman in 1841,—lying close to the frænum on the outer side of the *genio-hyo-glossus* muscle, beneath the mucous membrane of the tongue. It would be well if the old term *ranula* as applied to these growths were discontinued. The word itself is an absurd one, and the condition expressed by it has been inextricably associated with a false pathology.

The pressure on the hyoid apparatus by means of a large cystic tumor is often sufficient to threaten apnœa. Bransby Cooper narrates a case where a prompt opening of the cyst was required to save the life of the patient.

Another form of cystic tumor distinct from the foregoing lies deeper than Fleishman's cyst, and in developing makes little or no impression within the alveolo-lingual groove; but instead, expands within the supra-hyoid space. This has been well described by Bell.†

Later, Erichsen‡ recorded a case which has been reproduced in the work on surgery by the same author. These contained pultaceous, caseous matter, and were doubtless sebaceous cysts. Dr. James E. Garretson§ operated upon a cyst similarly located, which contained a thin, jelly-like fluid. Bryant|| believes the sebaceous variety to be always congenital. In the two cases coming under his observation, both patients were under twenty years of age. The practice of opening cysts so located, by incision through the integument, has been generally discountenanced.

The sublingual fold is often extraordinarily enlarged as a complication of glossitis. In an instance of this mentioned by Dr. Davies,¶ the sublingual mucous membrane was raised, as it were, into a second gum by serous infiltration.

* Virchow's Archiv, Bd. vi. Heft 27.

† Principles of Surgery.

‡ Lancet, 1856, ii. 619, where two by Fergusson are also mentioned.

§ Diseases of Mouth, Jaws, etc.

|| Surgery, 242.

¶ Med. Times and Gaz., 1860.

W. Fairlie Clark* narrates a case in which the symmetrical enlargement of the sub-lingual folds, due to the irritation of a carious tooth, simulated cystic tumor. They formed a tumor of a horseshoe-shape round the free portion of the tongue.

(To be continued.)

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the Office of the Librarian of Congress at Washington.]

(Continued from page 405.)

HAVING studied the subject of relative liability of teeth to decay, it becomes our next duty to consider the methodic examination which alone can disclose to us the condition of any denture.

To the superficial observer, this matter of a dental examination is one requiring but a short space of time and a limited amount of trouble; and this opinion is likely to be retained for some time to come, from the numerous instances constantly occurring which seem to demand but a casual glance from practiced eyes to ascertain either the cause for existing trouble or the probable exemption from necessity for closer examination. But instances are almost as frequently occurring which do much harm by impairing the confidence of patients in practitioners eminently worthy of the highest respect.

These are cases in which patients request a moment's time, merely to be assured that they are not in need of dental attention. No indications of trouble are present; no warning sensations have been experienced; that laudable desire to so act as to preclude the possibility of injury from neglect alone instigates the visit; the idea of these patients that a momentary glance *will* suffice is too often sustained by the action of even the most careful men of our profession, and they are informed that all seems well.

In a month's time, sometimes in a week, the searchings of sweets, salts, and sours, provoke a degree of discomfort which induces another visit, this time with the doubt existing as to the reliability of the recent examination, and with the power to indicate the probable location of the cause of pain. Another examination will possibly reveal nothing presenting any change of structure, or even color, which warrants the belief in any lesion; but a third visit of the patient induces the commencement of that wedging apart of the teeth, which discloses a cavity containing an amount of denuded, decaying, and sensitive dentine which would pro-

* Loc. cit., 220.

perly be regarded as sufficient to be capable of producing a vast amount of suffering; or again, a distance having been placed between the patient and the regular operator, and the urgency of the case seeming to admit of no delay, another dentist is solicited to examine, and, guided by the sensations and indications of the sufferer, may possibly without much difficulty find a hidden cavity of comparatively large dimensions, containing an almost or entirely exposed pulp. Here is a situation which seems to warrant an entire loss of confidence in the previous examiner, and I can easily imagine that no practitioner would have much excuse for or sympathy with such a professional misfortune until it had happened to himself a few times. And yet these instances have again and again been written of, and spoken of, by such as feel able to do so, for the benefit and warning of those who are following in the pathway; and still each day's experience adds to the list of imperfect examinations. Therefore it is that always, when a request for examination is coupled with the intimation from the patient that it will take but a moment, the incorrectness of the idea should be briefly stated, the necessity for care, and at least a respectable degree of thoroughness, be urged; and if either patient or operator be pressed for time the superficiality of the service rendered should be commented upon, and the information *distinctly* given that, *so far as such hurried glance can tell, nothing exists requiring attention.*

In making a thorough dental examination, it is usual to employ a mouth-mirror; a small hatchet-shaped and small hoe-shaped excavator; two fine probes, such as are used for entering pulp-canals and extirpating pulps; the one capable of being bent so as to feel at any desired angle, and the other having the end hook-like, and with some spring, so as to catch in cavities, crevices, and abrasions; and either floss silk, gill-net twine, or the fine thread of book-binders, to pass between the teeth, and, by moving from without inwardly and from within outwardly, test by its being frayed, or passing uninjured, as to cavities or roughness existing in positions where visual and instrumental examinations are alike impossible without previous preparation.

The examination should be carefully, systematically, gently, and thoroughly performed, moving sufficiently rapid not to consume time needlessly, and yet slowly enough to insure the required result.

Probably the most generally acceptable system for examination is that which begins with the distal tooth of the right upper jaw, continues tooth by tooth until the length of the upper arch is completed, then drops to the lower jaw and continues there until the length of the lower arch is completed, thus finishing under the point of commencing.

By adopting this method of procedure, a route is established which precludes the possibility of overlooking any tooth, and at the same time insures that each tooth shall be examined but once.

Although it is admitted that no two teeth ever decay precisely alike, and that any tooth may possibly decay in any position, yet it has been observed that not only do teeth possess a relative liability to decay, but that each also has certain positions where decay is so likely to locate as to render it advantageous that these should be mentioned, as greatly aiding the facility with which thorough examinations may be made, and even superficial examinations rendered more valuable.

Thus, the upper wisdom-tooth decays in the *sulci*, upon the *articulating* face, upon the *buccal* face, quite frequently upon the *mesial* face, extending up to and under the gum; upon the *lingual* face, near the neck of the tooth; upon the *distal* face, including the *disto-articulating angle* frequently, and upon the distal face *fairly*, circular and circumscribed, infrequently.

The second molar decays in the *mesial* and *distal sulci*, upon the *mesial* and *distal* faces, and upon both *buccal* and *lingual* faces; sometimes fairly upon these faces, sometimes more decidedly near the neck, and oftentimes inclusive of the *various articulating angles*.

The first molar decays practically like the second molar.

The bicuspid decays in the *sulci* upon the *articulating* faces, upon the *mesial* and *distal* faces, upon the *buccal* faces near their necks, upon the *lingual* faces (infrequently) near their necks.

The cuspid decays upon the *mesial* and *distal* faces, upon the *labial* face near the neck, upon the *lingual* face when the peculiar formation of either crevice or sulcus (due to small cusps) exists, and *directly upon the end of the cusp*, infrequent; when decay locates upon the cusp of the cuspids, it is usually very markedly circumscribed and accurately placed.

The lateral incisor decays upon the *mesial* and *distal* faces, upon the *lingual* face in a *sulcus almost always existing there*, upon the *labial* face near the gum, and (infrequently) upon the *cutting edge*.

The central incisor decays upon the *mesial* and *distal* faces, upon the *labial* face, sometimes upon the *lingual* face, and (infrequently) upon the *cutting edge*.

The lower wisdom-tooth decays in the *numerous sulci* upon the *articulating* face, largely upon the *mesial* face, upon the *distal* or *disto-buccal* angle, upon the *buccal* face, at the *buccal* neck, and (infrequently) upon the *lingual* face.

The lower molars decay in the *sulci* of their *articulating* faces, in the *buccal sulci* frequently, upon the *mesial* and *distal* faces largely, and upon their *lingual* faces sometimes; these teeth are also quite liable to decay around their necks, the cavities extending greatly under the gum.

The lower bicuspid decays upon their *articulating* faces, their *distal* and *mesial* faces, and their *buccal* faces near the gum.

The lower cuspid decays upon its *mesial* and *distal* faces, and upon its *labial* face near the gum.

The lower incisors (lateral and central) decay upon their *mesial* and *distal* faces, their *labial* faces near the gum, and sometimes upon their *cutting edges*.

I have intimated that an opinion based upon a good examination might *possibly* be found unreliable; but no inspection which has omitted the positions between teeth, to which I have referred as not permitting visual or even instrumental examination without previous preparation, can be regarded as at all trustworthy.

It is by no means universally the case that the amount of time and trouble necessary for a thorough examination should be indulged in, for it would be much too frequently not compensating to the patient; but great care should be exercised that no indication of decay between teeth is overlooked.

It is markedly the case that thus early in the practice of dentistry, judgment and experience are invaluable to patients, as attributes of their operator, but it is also here that we may as clearly notice the earnest efforts of those who have by proper use of time and opportunity became possessed of these qualifications, to aid to the utmost the young practitioners of our specialty; thus it is that the comparative worthlessness of ordinary examinations is frequently spoken of and written about; that systematic and thorough efforts in this direction are warmly urged; that the education of patients, to the end that they shall have a different apprehension and appreciation of this matter from that ordinarily maintained, is constantly advised, and that every possible hint is given which may tend to add value to the efforts of any dentist.

If in any case the sensations of the patient, or the indications, either visual or tactile, point to the *advisability* of a more thorough examination between teeth, the necessity for a separation becomes at once apparent.

For the accomplishment of this, we have the most antagonistic operations equally advocated by the accepted authorities; I can therefore give, in this connection, no views which I hope to have generally acceptable at present, but in this, as in many other things, which I shall discuss, I can only trust that I shall be credited with sufficient faith in the practicability of that which I advocate, to induce others to view not unfavorably that course which has proven, at my hands, productive of much comfortable relief from suffering.

The teachings of "mode of separation" extend from that of universal opening, by instrumentation between teeth, even those which are not decayed (from the prophylactic standpoint), through the range of separation in this manner of such teeth as are decayed, particularly incipiently, thus making, as is claimed, the most thorough protection possible

against further progress of decay ; from this we have that kind of separation by instrumentation which admits of restoration of contour to the defective teeth by the employment of some filling material ; this method is only urged when it is known that decay exists. We next have "rapid separation," by the use of wedges made of either hard or soft wood, or, again, less rapid separation by the use of the elastic gum, india-rubber, stretching to thinness a piece of sheet rubber, drawing it between the teeth, and allowing it to resume an approximate to its former thickness, clipping off the protruding ends, and permitting it to remain until by its elasticity it forces the teeth apart ; or, again, "slow wedging," by the use of moderately introduced wedges of soft wood, renewed day by day until the desired result is attained ; or, again, the same slow wedging from the employment of cotton wool rolled into pellets, and, with the aid of appropriate instruments, pressed gently or firmly between the teeth ; or, from the use of paper, muslin, flax, or other like substances, introduced either rolled, folded, or in pellets.

The operation of separating the teeth seems to be that connecting link which most naturally unites operative dentistry with dental pathology. We find a large field to be covered by teachings in relation to operative dentistry, and we also recognize that so much instrumentation is required for the conduct of a practice which may be regarded as strictly confined to the limits of dental pathology and therapeutics, that we should not be surprised to find much material upon these points in works professedly upon operative dentistry ; inversely, then, we shall equally find that the special treatment of the subjects of dental pathology and therapeutics will entail the necessity for frequent entrance into the domain of operative dentistry ; but I am convinced that it will constantly be admitted that completeness of purpose could better be approximated in this than in any other way.

It would seem that the question of separation of the teeth by instrumentation for the purpose of *preventing decay* is one which cannot, in justice, be considered other than as of grave importance. Its presentation to the profession by so careful an observer as Professor Robert Arthur* would alone entitle it to very respectful consideration ; but when it is dispassionately urged, and seemingly sustained by the practice of a long series of years, it is due to the subject that it should be made one of practical experimentation rather than merely commented upon in the form of argumentative criticism or theoretic condemnation. The length of time which has elapsed since the promulgation of the views referred to is insufficient to admit of consideration in the only

* The proposition of Professor Arthur is "the separation of teeth closely in contact, which are of such frail character, and are exposed to such destructive influences, that their decay is inevitable or has already occurred."

manner which would seem to be just ; I shall, therefore, restrict remarks at present to that line of conduct which contemplates nothing more than dental examination.

(To be continued.)

ENGLE'S PATENT FOR SECURING PORCELAIN TEETH TO GOLD OR SILVER PLATES.

THIS patented improvement in artificial dentures is one which, in consequence of recent developments, is likely to attain to considerable prominence. It is the invention of Mr. S. D. Engle, of Hazleton, Luzerne County, Pennsylvania, to whom much credit is due for developing this combination, by means of which we are able to produce an artificial denture embracing all that is good in metallic and vulcanite work, at the same time avoiding the great defects of each.

It is applicable to either gold or silver, but when silver is used the plate should be protected from contact with the rubber by means of tin foil.

Within the last few weeks it became evident that unless the right to use this combination was secured to the dental profession, it would in all probability fall into the hands of those whose interest it is, by obtaining control of valuable improvements, to leave the dentist but little freedom of choice.

In view of these facts, the letters patent herein described were purchased by and regularly assigned to Charles J. Essig, secretary of the *Association for the Protection of the Rights of Dentists*. The matter was laid before the association at its last stated meeting in June, and discussed by Drs. Buckingham, Head, Pettit, Jack, and others. On motion of Dr. Buckingham, it was *Resolved, that the Association for the Protection of the Rights of Dentists* appropriate a sum sufficient to reimburse the secretary for expenses incurred in obtaining possession of this improvement. This resolution was unanimously passed.

The association not being a corporate body, Dr. Head offered a resolution by which the secretary was ordered, as the letters patent had been assigned to him personally, to properly dedicate and assign them to the public, and to publish the same.

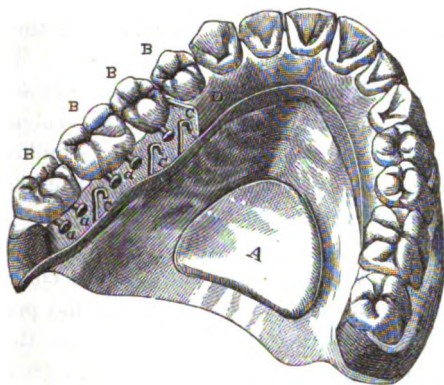
The following is the schedule referred to in the letters patent and part of the same, granted to Stephen D. Engle, of Hazleton, Luzerne County, Pennsylvania, dated the thirty-first day of May, A.D. eighteen hundred and sixty-four :

"Be it known that I, S. D. Engle, of Hazleton, in the County of Luzerne and State of Pennsylvania, have invented a new and useful improvement in artificial dentures, and I do hereby declare that the

following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of the specification; said drawing representing an inverted perspective view of an upper set of teeth, and showing some of the vulcanite to have been removed or omitted to expose the stays or hooks which constitute my invention.

"The invention relates to dentures in which the teeth are secured to a metallic plate by means of vulcanite; and it consists in the employment of metal stays or hooks soldered to the metallic plate in combination with projecting pins on the teeth and a vulcanite connection, the principal objects being to obviate the warping of the plate, to reduce the work of fitting the teeth thereto, and to form a better hold for the vulcanite, and thereby enable the teeth to be more firmly secured thereto.

"To enable others skilled in the art to apply my invention to use, I will proceed to describe it with reference to the drawing.



"A is the plate, and B B are the teeth. The teeth are of the kind furnished on their inner sides above the lingual surfaces with pins *a a*, and now commonly used for vulcanite work; *c c* are the stays or hooks which constitute my invention, made of platinum or other wire, and soldered to the plate upon the ridge which conforms to the alveolar ridge of the gum. These stays or hooks are so arranged that they come between the pins *a a* of the teeth, so that the vulcanite *d* surrounding the said stays or hooks, and the pins *a a*, is attached very securely both to the teeth and the plate, and secures the teeth firmly to the plate.

"The use of the stays or hooks *c c*, soldered to the plate and not to the teeth, obviates the warping of the plate which frequently results when stays are soldered both to the plate and teeth, and also obviates the danger of cracking the teeth. It reduces the work of fitting the

teeth, by obviating the necessity of grinding the teeth to fit the plate. It also prevents mucus and food from getting under the teeth and producing fetor.

"The invention is applicable to whole sets, or to the fastening of single sections or plain teeth to metallic plates by means of vulcanite.

"What I claim as my invention and desire to secure by letters patent is: The metal stays or hooks *c c*, soldered to the metallic plate, in combination with the pins *a a* of the teeth, and with the vulcanite, for securing the teeth to the plate, all as herein specified."

S. D. ENGLE

Witness: } W. KISUN,
 } JOHN BEISEL.

It will be observed that Mr. Engle claims for his invention an improvement over ordinary metallic work; he was doubtless impressed at the time with the unfitness of vulcanite as a base for an artificial denture, and therefore says nothing about it in his specifications. The test of time has only convinced many of us who hold the interest of our patients of importance, that its want of strength and consequent necessity of frequent renewal renders the vulcanite case in the long run more expensive, and that its non-conductibility, which frequently produces a modification of the mucous membrane, its bulkiness, its want of weight in lower cases, the fact that with its use the best adhesion cannot be obtained, are great defects which will ever render it one of the poorest, if not the worst, material used for the purpose.

The counsel for the Vulcanite Company, in his closing argument in the late suit, claimed that it had been admitted that previous to the introduction of vulcanite work "there was no such thing as a cheap, practical, valuable dental plate;" and that "it is a great benefaction to mankind, promoting health and prolonging life," etc. Yet if we were to deprive vulcanite of its only great advantage, namely, its applicability to the improvements in porcelain teeth, what would become of its popularity? The sectional or block teeth, which are kept in large quantities at the dental depots, enable the dentist without delay, and at small cost, to obtain sets of teeth greatly superior to anything of the kind applicable to soldered work; all the troublesome grinding and fitting of single gum teeth and the delay, etc., of carved work, was by this improvement rendered unnecessary. It is no wonder, then, that many looked upon vulcanite, notwithstanding its apparent defects, as a royal road to the best results in mechanical dentistry. Time, however, has demonstrated that we were only shifting difficulties from one direction to another, and that, if labor and trouble were saved in obtaining and fitting the teeth, in consequence of the weakness of the material, the vulcanite case would break in spite of all that could be done.

It follows, then, that if it is admitted that health is promoted and life prolonged by an artificial denture, the art which produces such "a benefaction to mankind" occupies a position second to no other art or profession; the materials which enter into the construction of this artificial substitute for what is really a part of the digestive apparatus, and by which the first and a very important step in the digestive process is performed, should be selected with a full appreciation of all the qualities requisite, and which science and art afford.

It is believed that this method, invented by Mr. S. D. Engle, and described in the forgoing specification of letters patent No. 42,933, dated May 31st, 1864, embraces all the qualifications of a thoroughly good artificial denture; and all right, title, and interest in the said letters patent is hereby abandoned to the public forever by the assignee.

CHARLES J. ESSIG,

Secretary A. P. R. D.

PROCEEDINGS OF DENTAL SOCIETIES.

ILLINOIS STATE DENTAL SOCIETY.

THIS society met for its tenth annual session at Jacksonville, May 12th-15th, 1874. The forenoon of the first day was occupied with hearing reports and other routine business. In the afternoon Dr. C. Stoddard Smith, the president, delivered the annual address, from which the following are extracts:

The custom of annual conventions of the various bodies of all kinds has become well-nigh universal. Not only do the members of the learned professions and scientific societies meet to deliberate upon subjects pertaining to their various departments, but the infection, if we may so term it, has spread into all sorts of bodies, with all sorts of objects. The mechanics and tradesmen have caught it, and we behold the annual meetings of the railroad-car builders; of the national carriage-makers' association; of the brotherhood of locomotive engineers; of the iron-masters' association; of the railroad ticket and freight agents; and even lately we have read of the proceedings of the national association of bill-stickers, met in solemn conclave to deliberate upon the proper consistency of paste, the artistic effects produced by the combination of colors (high art this is, of course), and the methods to be adopted to secure "the profession" from the impositions of irresponsible showmen.

Another year has passed away, and we, too, are assembled to compare notes and review the operations of a twelve-month now forever past. But though there is an apparent similarity between our meetings and those of the bodies we have named, yet there is, in reality, a

marked contrast as regards the objects for which we meet. If we analyze the motives from which spring the gatherings to which we have alluded, we shall find that at the bottom of all lies the "almighty dollar." They meet to deliberate upon the way in which best to promote their material and pecuniary interests; the way to make a larger percentage upon the capital invested; or to prevent loss by a combination to control the market for their wares or labor. But with us, the case is far otherwise; that is, if we follow the legitimate objects of our association as expressed in its constitution and by-laws. We do not meet to find out how to fill a tooth in the cheapest and most profitable manner; how to save a portion of our expense for material or assistance, or to combine for the purpose of fixing a tariff upon our services. Our true object is one in which the subject of pecuniary profit has no direct part; science and our art, and our improvement in both, are the primary objects, and they are closely followed by and scarcely subsidiary to the secondary one, which is the good of the community, by rendering ourselves better fitted for our duties and more useful to our patients and the community. Thus the line is sharply drawn between those who from motives of selfishness and policy associate themselves together, and those who with a noble devotion to science and scientific knowledge and skill, sacrifice, perhaps, for the time being, their pecuniary interests to lend their presence and assistance to the efforts to advance these objects:

I congratulate you, gentlemen, that you are now assembled for our tenth annual meeting. It is not my purpose to indulge in any extended self-adulation as regards our position as a society; of our growth in the nine years past from feeble beginnings to our present status. But I think I may be excused for expressing what I think is a very pardonable pride which I have, in standing as I do before a body which has won for itself at least a favorable if not an enviable position among similar associations of our country, if not of the world. Our published transactions have been widely circulated, and the initiative thus taken by us has found imitators among other societies.

* * * * *

The relations of dentistry in the present age, and its tendencies in connection with the spirit of the age, are subjects which have occupied my thoughts to some extent; and I will venture to intrude upon you a few of the many aspects in which they have been presented to my mind.

As you are well aware, the present age is one of progress and of activity. Except in the remote country village, the slow life of our fathers is a thing of the past; men think, and work, and eat, and sleep with a degree of velocity entirely unknown to the people of former centuries.

* * * * *

What now do we find to be our relation as a profession to this state of things, characteristic of the age? Have we, in emerging from the obscurity of our former position, so improved our methods as to render ourselves useful to the great mass of the people,—the millions who in all countries make up the bulk of the community? I answer that we have not; but that, on the contrary, the tendency is to deprive a large portion of the public of the benefit of skillful dental services. We have, we think, improved our methods of operating; the quality of our materials; the finish, and number, and expensiveness of our instruments; but in the operative department of dental practice, with the single exception of the burring engine as a time-saver, almost all our efforts have been in the direction of improved results, irrespective of the expense of the instruments and materials employed, irrespective of the discomfort to the patient of long operations, and of the time and expenditure of vital force necessary on the part of the operator before he can behold the results at which he aims, and irrespective of the remuneration which we must require to compensate us for all these expenditures. As a consequence, we are obliged to make such charges as practically to deprive all but a comparatively small portion of the community of the benefit of our services. And so the contrast between us and others is very marked. We can, if we are conscientious, only give in every case the highest results of which we are capable. We render no service unless we render the best. . . . But in dentistry that which costs little is not only worthless, but generally worse than this: it is not merely money thrown away, but it is injury inflicted upon a vital organism which can never be repaired. The very name of cheap dentistry carries with it a stigma, and justly so; for we can only reach the point where we may confer benefit by an expenditure of time, and skill, and material, that obliges us to make such claim for our services that we are surely rendering ourselves unapproachable by the great mass of the people. And even then, leaving out the operators in the large cities who command large fees, we feel oftentimes that we are insufficiently remunerated for some of our operations, when we have obtained all that the patient is able to pay.

After this, Dr. C. A. Kitchen, of Galva, read an essay on "Dental Students," of which the following is a very brief outline:

Our profession may be compared to a building, of which dental pupilage is the foundation; and it is of infinite importance that right material be selected, and that thoroughness be enjoined in all that enters into or composes this basis. In order to place and keep our specialty on a plane with other kindred pursuits, we must demand of our students that they should possess moral principles and a thorough general education; and that they enter into an agreement to pursue a three-

years' course of instruction, and complete their professional foundation with a full and regular course of dental-college lectures.

Discussion being declared in order, Dr. Cushing, of Chicago, said: This matter strikes at the very beginning of the elevation of the dental profession. The subject of legislation, which we have agitated somewhat, was intended to bring this about, but this question of *whom* we take for our students goes to the very root of the matter. The responsibility of taking students certainly is very great, and the utmost care should be exercised in the selection of the material for the future dental profession; and the requirements enumerated in the paper are not in any measure overstated.

Dr. M. S. Dean said: Without requiring of our students a thorough education, we can never rank ourselves among the learned professions. We must not be only artists and scientists, but we must have a broad literary culture, a thorough literary education, as a basis for our professional education, for without this we only assume the name without possessing the attributes of a learned calling. . . . No profession, except, perhaps, that of medicine or the ministry of the gospel, needs these qualifications as much as does ours. We are constantly brought into close relations with the most refined, cultivated, and sensitive classes in the community, and our services are of such a nature, both tedious and painful, as only to be rendered tolerable by the aid of that refining influence which a liberal education only affords. . . . However much practical ability we may possess in our operations and skill in the empirical treatment of the minor diseases of the oral cavity, we can never justly claim the name of a learned profession until we demand of our pupils a good preliminary education before they are admitted as students to our offices.

Dr. Low said: It is in the first place essential to educate the public to discriminate between the well-qualified and the impostor, as, no matter how careful we may be in the choice of our students, if the quack turns out three to our one, the great body of men calling themselves dentists would be made up of these quacks.

Dr. Black, of Jacksonville, said that there might be some injustice in the exacting of the course laid down in the essay, but that if such a course was not pursued we could never, as a body, attain to the high standing of a learned profession. With our present educational facilities, it was certain that both the interests of the profession and the public demand better qualifications. He hoped the day would come when every dentist would have a general medical education.

Dr. F. W. Dean, of Pekin, said that while it might not be an easy matter to obtain students with the educational requirements enumerated in the essay, it was yet an easy matter to find young men with a strictly moral character, and he would deem this of the utmost importance. A

very fine education, even without this, would be entirely inadequate to fit one for the practice of our profession.

Dr. Kilbourne, of Aurora, said that some men only consider the amount a student can pay, or how much they can make out of the circle of his acquaintance, without regard to the fitness of the applicant.

Dr. Townsend, of Pontiac. The objection has been raised that the action of this society, making it obligatory upon the members not to take students for a shorter period than three years, would have a tendency to drive young men into the hands of unprincipled men, on account of the length of time and obligation to graduate from a regular college before commencing to practice required of them.

Dr. Honsinger, of Chicago. Students should have a natural mechanical talent, without which he should deem them worthless.

Dr. Harlan, of Chicago. Such men, with this qualification alone, will never become educated *professional gentlemen*. The ability to manipulate comes after knowledge is obtained, and too many dentists look to the acquirement of manipulative ability at the expense of that of scientific knowledge.

Dr. Kitchen, of Galva. Apprentices to the mechanic trades have to give three years to their acquirement. How much more important, then, is it that in our calling, which, as it now exists, combines art and mechanism with science, the time spent in preparation should be at least as long.

Dr. Swain, of Chicago, was in full accord with the paper. We are the educators of to-day; the students whom we send out will be those of the future. Was sorry that so comparatively few graduates from the dental colleges took part in society meetings. He did not know how to remedy this, unless it could be done by the professors in the colleges laying stress upon the importance of this matter in their lectures.

Dr. Huckstep, of Jacksonville, thought some students might acquire as much in one year as others in three, especially if the first two years they were only employed at collecting bills or doing the marketing for their teachers; or, if they are attending college, they hear the professor lecture to do a thing in one way, and afterwards they find him doing it in another in his laboratory.

Dr. Sturgiss, of Quincy. There is no excuse now for not being properly qualified. To teach our students, we should ourselves be willing to work. Students should have a great sense of honor and intuitive goodness; for there is no calling where there is so much opportunity to be dishonest. Legislation will never remedy this matter.

Dr. De Crow, of Quincy. Not every young man is fitted to become a dentist. He should be a scholar and a gentleman. Children of

tender years are intrusted to our care, and our influence must have an effect upon them either for good or for evil.

When he was a student, he was never allowed to enter the operating-room, except when the bell rang; and, as soon as his services were no longer required, he had to retire to the laboratory.

On becoming a member of this society he realized his incompetence, and he would thankfully acknowledge that all he knew of dentistry, or whatever of skill he possessed, he owed to this society; he felt truly grateful for this, and would always say, All hail the Illinois State Dental Society!

Dr. Patten, of Lexington, thought it would be well if those who had students would impress upon them the importance of attending society meetings, and listening to the discussions, and observing the different operations in the clinics.

Dr. Morrison, of St. Louis, being called for, said he agreed with all that had been said; instructors had much to be sorry for. (Laughter.)

Dr. Kilbourne. Why do the graduates not more regularly attend society meetings?

Dr. K. B. Davis, of Petersburg. There are in all professions two classes of students: some study arduously, others spend nearly all their time in revelry and pleasure; some have no taste for study beyond the amount absolutely necessary to help them to pass the examination, others study from a love of gaining knowledge. Both classes graduate, the one to use the knowledge already gained simply for a foundation upon which to build, the other, assuming that they have learned all there is to know, lay aside their books and devote all their time to building up a practice and making dollars.

He was proud of the position this society had taken in establishing the time necessary for preparation to practice, and he felt that the result could be only beneficial to the profession and its patrons.

Dr. C. R. Dwight, of Danville, then read an essay on "Why so many Failures in Dental Operations?" As want of space will prevent us from making a very extended synopsis of the answer to this conundrum, we will simply say that the author ascribes the greater number of our failures to the inadaptation, dishonesty, or ignorance of the operator, although he admits that some failures occur for which the dentist is not responsible. Dr. H. H. Townsend, of Pontiac, then read an essay on "Thoroughness and Honesty in Dental Operations," of which it would be impossible to make a satisfactory synopsis, yet it would, perhaps, not be improper to say that the "*want of honesty*" was pretty severely handled.

Discussion on both these papers read then being declared in order, Dr. M. S. Dean said he should only speak of the causes of failure for which the operator was wholly responsible. They are owing in the

first place to the want of judgment in preparing the cavity. The tooth-substance at the margin or orifice of the cavity has been left too frail, jagged, or unsound, or retaining-pits or undercuts have not been properly made so as to retain the filling; and in the second place, the gold has not been brought into actual contact and thoroughly condensed against the margins, or the gold has not been placed so as to hold together in one mass. . . . After the cavity has been excavated as thoroughly as the case will admit of, creasote or its equivalent should be applied to the *dry* surface of the cavity, to prevent any chemical change that might eliminate gases that might force out or loosen the filling. . . . If non-cohesive gold be used against the margins of the cavity, we shall be more certain to make the plug a tight one than if cohesive heavy gold were used, but he did not wish to be understood that perfect margins cannot be made by heavy cohesive foil, but that it requires greater patience and skill than a majority of us possess, and therefore may be one source of our failures.

Dr. C. R. Butler. That certain failures would occur even where a great deal of thoroughness is exercised is true, and in such cases he thought it was due to overpacking.

He is not an advocate of any particular form of gold, but believes we have been using too cohesive gold; but this is one of the things that each one must correct or regulate in his own practice, and not by severe criticism of others.

If the patient cannot give the time to have a tooth *properly* filled with gold, we had much better fill such a tooth with Hill's stopping. He would rather use inferior materials for patients who could not pay for gold, but give just as good operations as possible.

We should be careful whom we take as students, and whatever time and experience has taught us they should have the benefit of; this is the point at which we make the biggest kind of a failure. The colleges give us just such graduates as the material sent to them will make, and we must commence well if we desire to end well.

Dr. Swain was glad that the question of overmalleting had been raised. He was convinced that the least amount of malleting that would condense a filling was sufficient, and anything beyond that was liable to prove injurious to the tooth.

Dr. Black. There is one class of failures to which men practicing in country towns are most subject, and that is, they often undertake operations they cannot get the time to properly complete. In filling bicuspid or molars, with pulps dead and roots filled, decayed deep on proximal surfaces, the retaining-pits should be well in from the margin, should start at the retaining-pits and gradually approach the margin, building up a thick sheet of gold so that it may not curl up and leave the margin under the blows of the mallet, causing failure.

Dr. Marsh, of Chicago. In such a case should cut the bottom squarely, have no retaining-pits, and start with soft gold. If soft gold were more used in such cases we would have less discoloration around the margins, and ink would not intrude between the walls of the cavity and the filling, as in the experiments that he had read about and he himself had verified.

Dr. Harlan has made various experiments with the ink-test, but when suspending merely the crowns of the teeth in the ink there was no discoloration around the filling in any case. He did not believe that extra-cohesive gold was always the best, but he did think that a water-tight filling could be made with it where *thoroughness* and *honesty* prevail.

Dr. Cushing. Overmalleting unquestionably is one of the causes of failure which we have not generally recognized; a great many of us do not realize what a thorough preparation of a cavity is, and by the aid of the magnifying glass we sometimes discover a line of light-colored enamel around the margin which the naked eye led us to suppose was perfect, but which is perceptibly imperfect under the magnifier, and should be removed. . . . Has not experimented himself with the ink-test, but when he hears gentlemen claiming as the result of their experiments in filling with cohesive gold, that ink will permeate between the plug and the walls of the cavity, he cannot help thinking that such experimenters had better have employed some other person to perform the operations.

Dr. Black stated that he used his gold ammoniated, and in this way obtained a gold perfectly non-adhesive, but which annealing would render cohesive,—and more fully demonstrated upon the blackboard his method of treating bicuspidis when decayed upon the proximal surfaces below the cervical border.

Dr. Swain. How do you ammoniate your gold?

Dr. Black. I keep some ammonia sprinkled in my gold-drawer.

The evening was consumed with further blackboard illustrations by Drs. M. S. Dean, Morrison, and Butler; but as the discussion depended mainly upon the illustrations, no intelligible report could be made of it.

In the course of the remarks, Dr. Butler stated that he never used extra nor non-cohesive foil, and never ammoniates his gold.

SECOND DAY.

The forenoon was occupied with clinics; at the afternoon session, Dr. Butler, of Cleveland, exhibited a set of mallet-pluggers, designed to be used when the operator does his own malleting, and explained their uses and advantages. After which, Dr. Cushing read "The Record of a Series of Experiments which he had made with regard to the Conditions of the Secretions of the Mouth."

Dr. Low asked if the subject of these observations was a dyspeptic.

Dr. Cushing. Not a bit. He desired to call the attention of the members to the care necessary in manipulating litmus-paper (he uses Squibb's preparation, as it is very delicate). It should never be handled with the fingers, as the moisture of the hands would entirely destroy the reliability of the test. It should be handled with a clean pair of pliers.

Dr. Black. Was the alkaline test made in case where no acid reaction was found ?

Dr. Cushing. Yes, but an alkaline reaction was found in only one instance.

Dr. Kilbourne said he had been laughed at, at the meeting of this society in Quincy, when claiming that pickles were not injurious to the teeth, when the fact is, as shown by the record just read, that there is no acid reaction in the mouth five minutes after eating pickles.

Dr. Black was glad that Dr. C. had made these observations; hoped that a number would make like experiments.

He has seen men carry litmus in their vest-pockets and use it as a means for tests afterwards; it is evident that such experiments must be worthless. When these tests are made, the condition of the subject and that of his teeth should be noted, and also the stage of decay, whether stationary or progressive, so that from these conditions deductions may be drawn.

Liebig and other German chemists reported that acids, taken as food, produce neutral and alkaline secretions. By alternating fruits, pungents and acids, the secretions can be kept normal. This is very important in cases of sensitive dentine at the margins of the gum, which, by keeping the secretions alkaline, will very soon lose its sensitiveness.

Prof. Taft. It is important to know whether Dr. Cushing examined the mixed saliva, the mucus, or the saliva proper; and, if the mixed saliva, the extent to which it was mixed.

Dr. Cushing. The nature of the experiments and the points at which they were made sufficiently answer this question.

Prof. Taft. Some persons, in their movements of the mouth, will thoroughly mix the oral secretions very soon after they enter; while in others, a thorough admixture is but slowly accomplished. Examinations of the saliva and mucus of the mouth should be made separately. The circumstances under which the saliva is secreted will somewhat modify its character; under the influence of some active stimulus it will present one phase, and without such stimulus another. When an acid reaction is found, its extent and character should be determined, and, until this is done, it is impossible to know what effects are liable to be produced upon the teeth.

Dr. Cushing. If a number of such observations are made, and in a

variety of cases, would they not give such data as would justify us in announcing the probable general character of the fluids of the mouth?

Prof. Taft. Yes; with a given patient at a given time, of course this is valuable; but it is not so definite as is desirable; it is not that absolute certainty that accurate chemical analysis enables us to make.

The subject having been closed, Dr. A. W. Harlan, of Chicago, read an essay on "*Ætiology of Dental Caries*," a synopsis of which cannot be attempted in this report, as it would be very unsatisfactory if brief, and too lengthy if satisfactory. Discussion being in order,

Dr. Forbes said: In some men the causes of decay are different from others. There are men who do not wash their faces, and do not even know what a tooth-brush is; yet they have sound teeth. The Irish immigrants have sound teeth. It is said that people who live near the ocean have bad teeth. He would say that the opposite is true, as common sense teaches him that there must be chlorine floating in the air. He thought Americans had better teeth than any other people, because it was more fashionable here to go to the dentist than among Europeans. When filling a tooth a long while ago for a lady who was horror-stricken with the gold that showed, he told her that her tooth was only jeweled, which was one of the refinements of civilization over the barbarians of Africa, who would jewel their ears and noses. Many years ago Eleazar Parmlly published a book on the decay of the teeth, in which he said decay commenced internally; and there are yet some few old men left who will say the same.

He does not believe that pregnancy makes the teeth decay; but the nervous system of some women becomes deranged, and often great pain in the teeth is produced. Has taken out a sound tooth in such a case, simply because the woman insisted that she would die if he did not.

Dr. M. S. Dean did not agree entirely with the paper on some points, though perhaps he might not be able to prove the contrary side. The decay of the dentine beneath the enamel, as has been alluded to, without the enamel being first disintegrated, lacked all sustaining evidence, and was contrary to his belief. The acids would not pass in between the enamel rods, as was suggested in the paper, to attack a structure for which it has a less affinity, as it would have to in this case.

Dr. Taft. Different individuals have different susceptibilities, and this applies to the teeth as well as to any other organs. In the discussion upon this subject, we are apt to forget diversity of structure; we suppose that all are alike, which is not true. It will be understood that there is an infinite variety of susceptibilities that pertain to the structure and character of organs of the body. Every tooth is different from every other tooth not only in microscopic differences, but

even in those apparent to the unassisted eye. There is a diversity in the development of teeth, owing to hereditary peculiarities. The material of tissue varies at different periods of life; there is an increase up to old age of the calcareous over the cartilaginous; and in estimating the cause of caries we cannot arrive at any definite conclusion without taking all these facts into account.

The structural character of the teeth is also of great importance. The quantity of material may be good, yet, owing to a want of proper vital force, the structure is imperfect, as shown by the white imperfect spots which are often seen in the enamel. Some diseases are very productive of defects in the teeth; they may at times not be visible to the unassisted eye; yet, wherever they are, there is a vulnerable point, the giving way of which will render vulnerable other parts of the structure. Such defects or peculiarities may miss one or two generations, and then again appear. This is true of other tissues and organs as well as of the teeth.

That gestation does influence the teeth of the mother there is no doubt, nor that the teeth during lactation and gestation often lose much of their density which they afterwards under favorable circumstances regain. Teeth of mothers during such periods require careful treatment. They are frequently sacrificed by mistake or ignorance; they should receive such hygienic and palliative treatment as will subdue the irritation and prevent active disease.

The exciting causes of caries are those things that dissolve out the lime-salts by chemical action, and the breaking-down of the organic tissue follows. Parasites may grow in the debris. That alkalies will enter into the circulation and destroy the organic matter of the tooth, and cause decay of the tooth, is wide of the mark.

There is no more occasion to bring in *Leptothrix buccalis* anywhere in the progress of decay as a cause, than there would be in saying that the worms which are found in the decomposing carcass are the occasion of the animal's death and decomposition.

Dr. Forbes. Few of us take into account the difference in the chemical laboratories of the sexes. He did not believe that pregnancy was the cause of decay or loss of the teeth on account of wasted tissue, as the amount of material lost monthly in the healthy woman would be fully sufficient to support the offspring had conception taken place.

Dr. Honsinger then related a story of a dentist who, having explained the causes of decay to a clergyman at great length, was asked by the same clergyman the next day, Why do teeth decay? To which he replied that he would give him a theological reason, as follows: When Adam and Eve transgressed, they did so by eating an apple; and as the teeth were quite prominent in the execution of this original sin, they were punished with early decay. (Laughter.) The speaker

continued, that there was no means for reaching or controlling the consequence of original transgression of the race.

Dr. Black did not know how much greater an influence that apple may have had upon the teeth than the rest of the body; but he was one of those who believed caries of the teeth to be a disease, and a disease that was not understood, nor its causes known. When one of the great Greek physicians was asked, thousands of years ago, Why do teeth decay? he answered that it was on account of the bad condition of the humors of the body, and that is about as much as we know about it. We say acids are the cause of decay; yet we cannot reproduce it with acids out of the mouth. The fact that some people who never clean their teeth have good teeth does not prove that their not cleaning the teeth promotes decay; but this must be ascribed to the teeth themselves, or to the condition of the fluids of their mouths.

Different classes of decay are only different stages or cessation of decay. He could produce all the different colors of decay out of the mouth with sulphurets.

Teeth with dead pulps decay more rapidly than those with living pulps, because in the one case the tubuli are open, allowing destructive agents to penetrate readily, while in the other case they are closed with a vitalized substance, which resists the ingress of such agents.

Dr. Swain. The gentleman stated that he could produce all colors of decay upon the teeth, by the means of sulphurets; how would he produce a yellow color?

Dr. Black. In a hydrochloric acid solution of a tooth, introduce sulphuretted hydrogen gas, and you will produce a yellowish color; and if you leave the tooth in that solution it will partake of that color. The bright, chalky color is about the only one that cannot be produced by sulphurets, and the only way to obtain it is by treating the tooth with acid and afterwards drying it.

Dr. Swain has produced that color with nitric acid.

Dr. Taft was sorry to hear Dr. Black say that the Greek philosophers of thousands of years ago knew as much of this matter as we do to-day. Thought the microscope and chemistry had taught him something during the last twenty years, and he certainly feels that he knows more about this matter now than then. He has had some experiments made by a very good analytical chemist, for the purpose of determining the coloring matter in decay of the teeth; his report was, that there was no trace of any metal in black decay, with the exception of a trace of iron, and not a trace of sulphur was found anywhere. His experiments, conducted during the last fifteen years, taught him that the mucus alone gave a definite acid reaction, and that decay goes on more rapidly when the watery portion of the mucus is evaporated, and the mucus thickens, as with open mouths during sleep.

Dr. Forbes. It is a well-known fact that, when teeth are decayed and the pulps dead, and they are filled, such teeth will be more liable to decay than if they had living pulps in them. Dr. Black says this is because the nourishment is cut off. It is also known that when a tooth is not dead and affected with chronic periostitis, the decay ceases. No part of the tooth in old skulls is found to have decayed after death; what is the reason that the tooth, when dead in the head, continues to decay? It must be caused by eating food.

Dr. Taft. After death, the destroying agent is gone. Do you often find chronic periostitis with a living pulp?

Dr. Forbes. Yes.

Dr. Taft. That must be a peculiarity of St. Louis.

Dr. Kitchen lives where there are many Swedes, who when they first arrive in this country have good teeth, but whose teeth decay in a few years after coming here. This must be owing to the changed mode of living. Some twelve years ago, during the excitement of the milk exposure in New York City, it appeared that the lower animals could be affected with diseases of the teeth, as the distillery-fed cows had ulcerated and decayed teeth.

Dr. Low then read at considerable length from written remarks upon the subject; he said that in order to understand the original cause of decay of the teeth, we must first learn as nearly as possible the original form or type of organized bodies and their relations to natural laws. All organized bodies are formed from those which have not organic life, and physical law is the established condition of things whereby all organized bodies maintain their original form and beauty. All variations from the original pattern of organized bodies are the result of violation or infringement of this law, under which no one organ in a perfectly developed body could fail any faster than another. The cause of decay of the teeth is the violation of these physical laws or conditions.

In commenting upon the fact that half the deaths in the United States are of children under ten years of age, he said that the wonder was not that so many died, but that so many lived. Children were maltreated from birth to death. Their waists were bandaged too tightly, their lungs compressed, their stomachs destroyed by a process of over-feeding, they were smothered in bed-clothes in unventilated rooms, and not allowed to breathe heaven's pure air or to feel the genial warmth of the sunlight; others were in a half-clothed condition exposed to cold, whence come coughs, colds, fevers, etc., when medicines had to be resorted to to check the disease.

Hot food and drinks, he continued, are very destructive to the teeth; no drink of any kind is needed with the food; it is unnatural, and is injurious to health and to the teeth. If food were chewed long enough, nature would supply sufficient moisture. Instead of doing

this, we rinse our food down with hot tea as soon as it reaches the mouth, and consequently derange the whole process of digestion.

In conclusion, the speaker said that he thought man was originally designed for a tropical climate, where he could partake of food as provided by the Creator, and which surrounded him in abundance, where he could partake of pure water, etc.

Dr. Huckstep asked if any member were to be so fortunate as to find the cause of decay, we should then succeed in stopping it.

Dr. M. S. Dean does not believe very much in "vital resistance" in the teeth to acids or other corrosive agents. Thinks that if one of his incisors were extracted and the pulp removed, it would resist the action of acids to the same degree that the other would which was left in the mouth, provided it (the extracted one) had not become dried. The mineral ingredients have the same affinity for the acids, whether they are grasped by the living tissues or not. Thinks that during the period of gestation the teeth of the mother do not suffer on account of any deficiency of lime-salts. At these times the fœtus does not take these ingredients from the teeth of the mother, as has been suggested, as there is an abundance of these materials taken in the food for both. The trouble probably arises from the general disturbance of the functions of nutrition and external causes, and not from the want of lime-salts.

Allusion has been made to the contemporaneous appearance of decay in the teeth of the inhabitants of the Sandwich Islands with the introduction of acid fruits. Although this may be strictly true, it by no means follows that these acid fruits were the cause of this marked increase of decay in their teeth. This condition of things, by the same mode of reasoning, might be charged to civilization, syphilis, and intemperance, which were also introduced at the same time.

The subject was then passed; after which the society adjourned.

NOTE.—The synopses of essays are of course very incomplete and unsatisfactory, and the discussions are also of necessity very much abbreviated in a report of this nature. Any one desiring to obtain a complete report can do so by addressing the secretary, C. R. E. Koch, 645 Wabash Avenue, Chicago, and inclosing fifty cents, as this society publishes its Transactions annually in book form.

(To be continued.)

SOUTHERN DENTAL ASSOCIATION.

THE sixth annual session of this society convened in Polytechnic Hall, St. Louis, July 28th, at 10 o'clock, A.M.

The session was opened with prayer by Rev. Dr. Linn, of St. Louis; after which the address of welcome was delivered by Dr. Isaiah Forbes, of St. Louis. Dr. Forbes extended a cordial welcome, not only in the

name of his professional brethren, but of co-workers in other branches of science; in that hall the Academy of Natural Sciences, the Medical Association, the Historical and the Microscopical Societies hold their meetings, and their libraries and museums, with that of the public school board, are placed at the disposal of the society.

President Arthur, in the name of the association, returned thanks for the cordial welcome to the city, and hoped that the future of St. Louis would, if anything, be brighter than its present or past.

The annual address was then delivered by President Arthur. It was exceedingly lengthy and also exceedingly interesting. We give a synopsis, as follows.

THE ADVANCEMENT OF THE PROFESSION.

Not only have great advances been made, but the details of practice are daily improved. The importance of dentistry to health and comfort leads us to claim that it is, in its highest aspect, a specialty of medicine. Medical men, however, ignore this claim, and consider it a mere mechanical occupation, requiring only skill and ingenuity. Editorial articles in the *Medical Times*, of late, exhibit the estimate in which dentistry is held. These articles claim that dentistry is purely mechanical as to the bulk of its practice; that the mass of dentists spend their lives in monotonous mechanical labor; high culture and education are in no sense essential to success. Dentists are worthy citizens, but not doctors, nor entitled to recognition as such.

We shall look candidly at the true status of our profession. There are ten thousand practitioners of dentistry in the United States. What is the daily occupation of this body? It is plugging and extracting carious, and inserting artificial teeth; this statement must be admitted. What kind of medical knowledge is required for this? Natural or acquired ability, with the appliances and material at hand, will suffice for the performance of these duties in an efficient manner. This is true of the practice of the mass, not underrating the skill and knowledge of a few. Extraction does not require any medical or even anatomical knowledge. The alveolus may be broken without injury. Mechanical dentistry as practiced certainly demands no skill that may not be acquired in a few weeks. Hard rubber has obviated the necessity of a knowledge of the fine metals. Though ingenuity is often required, yet many fine operators have been ignorant men. If dentistry does not mean more than this, it has no claims as a medical specialty.

It is not surprising that medical men chafe at hearing men called "doctor" who know nothing of medicine, even superficially, and are often unable to write an English sentence correctly. But dentistry as practiced does not represent the science and art itself. The best men take a higher view, and declare that the writer quoted is mistaken

through ignorance of the subject. When dentists become M.D.'s they will be better dentists, and the M.D. when he understands more of dentistry will be a better physician.

Dentistry deserves a higher rank,—1st, because it is intrusted with the care of parts of the human organism more subject to diseases than any other part, and some of these of the gravest character.

2d. The effects are not confined to the teeth, but sometimes affect the whole system, leading to severe suffering, and abridge life.

3d. For this reason diseased conditions of the teeth deserve special study, which medical men have not given and cannot give. They are ignorant of diseased conditions of the teeth; they give so little attention to their influence upon the general system that they overlook their agency in causing disease. It is important that there should be a class of specialists capable of estimating these effects. Physicians are engaged in battle with more deadly enemies, and are apt to overlook these less serious causes of disease. Their sources of information on the subject are deficient. Medical schools do not allude to it, except incidentally, and even when dental schools are connected with medical schools the Faculties of the latter do not advise the student to take an interest in dental instruction. Medical works are also sadly deficient. "Wood's Practice," a recognized authority for twenty years, teaches erroneous doctrines as to dental caries. (Quotations were here given by Dr. Arthur to show the superficial and exploded views laid down by Dr. Wood,—the ignorance of dental disease displayed by him,—and the improper methods of treatment recommended; and instances were quoted to show that physicians rely upon such means, in similar cases, showing that prominent medical men are ignorant of what should be done.) Professor Wood, in his lengthy list of remedial agents for odontalgia, has omitted the only one relied on by the dentist—arsenious acid. He refers to no dental work or authority recognized at the time he wrote. Later writers avoid the subject altogether, which it would have been well had Professor Wood done. The ignorance displayed by medical men is accompanied by great confidence in their knowledge of the subject. It would be well if the instructors would advise students to obtain special information on the subject. Much is done in England in this way, and the dental specialty is recognized. In this country it is ignored, and no reference is made to the influence of the teeth in the standard works, except casually. Too little attention has been given to this influence, as is illustrated by many instances, which show that serious trouble, defying the best skill for months, may arise from exposure of a pulp.

What, then, is the province and scope of dentistry? Teeth are not organs of sense, nor essential to life, yet they are of complicated structure, and in intimate union with the organism, presenting a gradation

from high vitality to entire absence of it, and the union cannot be made out even by the great aids to vision now employed. Their vitality is derived from the centers of life, the head and brain; the nerves are part of a great system, and intimately connected. This cannot be understood without a general knowledge of the vascular and nervous systems, not as a matter of interest but as essential to successful practice. It is an axiom that a clear comprehension of the nature and character of disease is essential to its cure. What is the nature of dental caries? This question has tasked the best intellects, but has not been answered with entire satisfaction. In general it is attributed to the action of an acid; but its nature and origin we cannot certainly give,—whether decomposition of foreign matter or of the natural secretions, or parasitic growths. Why the great difference in different teeth as to liability to decay, and in the rapidity of its progress? These indicate the extent of the subject, even in its simplest features.

The treatment of caries in its earlier stages is admitted to be merely mechanical; a skillful manipulator will accomplish more than the most learned physician. The necessity for splendid operations proceeds from neglect of simple and timely ones. The dental pulp is very subject to inflammation, and this subject has occupied entire works by able authors; three hundred of them were named by Hunter in his day, and since then they have increased innumerable. No man can be acquainted with the demands of dental surgery unless he has a clear general knowledge of this subject, only to be gained by special study. The connection of the teeth with the general nervous system requires an intimate knowledge of that subject. Teeth are needlessly sacrificed or wrongly retained for want of detection of their influence in producing neuralgic affections. Do dental colleges at present furnish the means for obtaining the proper education? Many of the best men will not accept their claims to do so.

Regarding dentistry as a very important specialty of medicine, they consider the regular study of medicine as a part of the course of preparation for practice. This view of the matter is rapidly gaining ground, and the time has come for the discussion of the subject. I have no feeling of enmity toward existing dental colleges, except where they have violated their obligations to the profession and the public. In such case it is our duty to do all in our power to destroy such institutions. We have interests to protect important both to ourselves and to the public. We must never forget that every individual who is turned out upon the community with the indorsement of a dental college assists to drag down our profession and injure the public, if he is not properly qualified. We must remember that the more highly educated those who are brought into the ranks may be, the greater their usefulness, and the greater respect they obtain in the eyes of the public. I

have but glanced at this part of my subject, but I trust you will go searching into it, and looking for the general good, commending only where commendation is deserved, and condemning abuses without fear or favor where you know them to exist. When we are ready to combine earnestly for the true elevation of our profession, it is impossible to tell what results we may not accomplish.

After the reading of the address, a Committee on Applications for Membership was appointed, consisting of Drs. Henkle, Gore, and Wardlaw, and a recess was taken to consider applications.

Dr. Redman was appointed treasurer *pro tem*.

Drs. J. S. King and R. R. Freeman, of Nashville, were received as delegates from the Nashville Dental Association, and Dr. S. Welchens from the Pennsylvania State Society.

Reports of Committees were called for, but most of them failed to respond.

Adjourned.

Afternoon Session.

The report of the Committee on Mechanical Dentistry being called for, a report from the chairman, Dr. J. B. Wood, of Richmond, was read by the secretary, of which the following is a synopsis:

No striking improvement has been developed during the past year, but this should not excite concern. What we need is not so much something new or more available, as a better use of what we have. The eager search for the novel is injurious to patient culture. Good, faithful work is the necessity of the hour. We need the same labor on replacement that we bestow on the natural organs. The laboratory is left in charge of an assistant, and has fallen in our esteem and that of our patrons. It should be restored to something of its former dignity, though the advances in operative dentistry forbid the former wholesale loss of teeth. The manufacturers of teeth have kept pace with the demand of the age. But we should not be led by those outside of the profession. We want honest workers in the laboratory, and the reform has evidently begun. Gold plates are reasserting their right to a place in the mouth; the cheap and horrid vulcanite is passing away. Its place is at the bottom of the list of materials for plates. All cheap work is hollow; the man who makes gold-plates half alloy, he who uses cheap teeth, or recommends rubber to save a few cents or to conceal his want of skill, all need converting. The "best men" should come forth, and show that there is a better way than the past. Patients are wary of the man who fills teeth cheaply,—will they not also beware of these? It is time for reform when we can count on our fingers the good plate-workers. We teach our patients that gold is better than amalgam; why not that it is best in the other department? The rubber litigation furnishes additional evidence that a higher standard is

needed. If it shall result in compelling a disuse of rubber, a substantial good will have been wrought. It is hoped the efforts to find a substitute will be crowned with success, and a better material found. The method of working rubber recommended by Stuck is worthy of experimentation. The hope that celluloid is better seems to have brightened into a substantial reality. It seems that, with careful management, it will not shrink or warp, and that it is durable seems probable. But the slovenly manipulation of vulcanite will not produce good results; and in this feature of greater difficulty of manipulation we see substantial merit. It is suggested that a metallic die should be used when practicable. With rose pearl greater difficulties are present, but the results are apparently excellent. Some careful tests compel us to believe that excellent results may be derived from the use of either variety of the collodion base. It is not fair to decide upon their merits on a single attempt, but your committee urge a patient trial.

The subject being open for discussion, Dr. Walker (New Orleans) said that he had been and was still an uncompromising opponent of rubber. He had seen many cases of disease produced by it, and had seen no case where it was worn without seeing injurious effects, and in some the results had been disastrous.

Dr. Welchens (Lancaster, Pa.) wished to inquire how the profession felt in this section as to the use of rubber. In his State many cannot get along without it. It has no doubt driven science out of the laboratory; not so much skill or science is required as to make gold plates, and almost any person can soon learn to put up respectable rubber sets; but notwithstanding this it is necessary to use it in the present status of the profession. The rubber litigation has gone by the board, so far as the Smith case is concerned. The one pending in Detroit promises better. Any one must acknowledge that the decision is one-sided; but he thinks he speaks what he knows about, when he says there will be no appeal. The profession has been derelict in sustaining those who have assisted in carrying on this litigation. He had worked gold a great deal, and wished it had not been superseded, but we cannot get pay for working it. We must be eclectic in our practice. At few points is a dentist able to confine himself to one branch or material and discard the others. In large cities it can be done, but not in small ones. We want to know whether you here are obliged to use rubber as we are, and to carry on every department. In discussion there is power, and we have here a living literature.

Dr. Morgan objected to the clause in the report as to using metallic dies; also to the position that difficulty of manipulation of a material is an advantage. Common sense contradicts that statement; the more ease with which a thing can be used the more valuable it is. Dr. Walker makes sweeping assertions about rubber, and his observation

do not accord with his (the speaker's) own. He has seen disease when silver plates were worn, and has found the difference in the effects of gold and rubber to be slight. He has been wearing rubber, and can show a healthy mouth. We are too apt to be influenced by our interests. 'Thought Dr. Walker's opposition to rubber dated from his persecution by the rubber company.

Dr. Walker said his opinions existed before any such event. He had come near losing his wife from the effects of a rubber plate which she had worn for three years, and continued to decline during that time and till it was taken out. He then began to observe and tried it in his own mouth, and found that the disease was confined to the mouths that wore the rubber plates. If he can be forgiven for the mischief he did before he discovered the trouble, he will never use it again. The first indication of the disease is a pallor of the gums; then bright red spots appear, with thickened mucous membrane, ropy saliva, and sometimes the general system is affected. Had known of a loss of twenty to forty pounds in weight from wearing rubber plates a few years. Knows that this was the cause, because there had been no other one apparent, and has seen it in so many instances.

Professor Judd. The question of the effect of rubber plates on the mucous membrane is an important one, and carries more with it than mere manipulation. We claim to be dental physicians, not carpenters. We should see that we do not produce disease in attempting to remedy defects. His attention was called to this subject a few years ago, and he had examined every mouth that wore rubber; red rubber was then more used, but now no one (here) uses red who has any regard for his reputation. He had seen a case of a piece of red rubber in a black plate, and the line was perfectly marked: healthy when the black was in contact with the soft tissue, but under the red it was in a state of active inflammation. There could be no other cause for this. He would not state that in every case, when red rubber is worn, inflammation occurs; thinks there is a difference in climate. In the north it probably does not produce such bad results. Every man who will make careful, candid examination will be convinced that there are bad effects from rubber. He has seen the bones of the palate attacked and necrosed when the patient was in poor health; and has seen many cases under different circumstances where the mouth was like raw beef, one in which it was actually suppurating. In many cases the disease is slight, and in a few there is no disease; but in a great majority there is. Has seen many cases cured of rubber disease by changing the plates for other material. Has seen the mucous membrane so swelled that he has worked upon it for months with iodine. Is satisfied that red rubber does exert a deleterious influence. Why should it not,—the red sulphuret of mercury worn next to the mucous

membrane? Some say it is covered by the rubber; the color answers that and common sense answers it. No one material covers up the others. It is not contended that there is any chemical action that converts this substance into an inert one. We should be cautious in the use of red rubber. Will not say that black produces them, but red certainly does most decidedly produce bad results.

Dr. Johnson (Va.) expressed the sentiments of Dr. Judd, whose experience accords with his. Finds a low order of vitality beneath rubber plates. Ten years ago resolved not to put it in the mouth. Had had no experience with black rubber. Has treated patients for months as a physician, and has in every instance restored to perfect health. Hopes every gentleman will discard rubber.

Dr. Knapp did not see how the heat of the mouth could set free mercury and produce deleterious results. Would like never to see it used except for temporary sets and regulating plates. Any plate worn continuously will produce the same appearance. With very accurate adaptation the circulation is interfered with. Rubber brings the practice into low ignorant hands. If used only as above, no very injurious results will follow.

Dr. Morgan thinks the disease attributable to the carelessness of the patient rather than to the material. In many cases where metal plates are worn there is disease. The worst cases he has seen were where gold was worn. In one case he had cured a diseased mouth, in which gold had been worn, by inserting rubber, and it had had no recurrence of the disease. In another case where coin gold was worn the mouth swelled and the saliva poured forth. These are cases of idiosyncrasy. Platinum may have been poisonous in cases. Cleanliness is a great help. Soap and water will not always cleanse the plate, but muriatic acid and water will.

Dr. Cobb. Is not prepared to say much as to the rubber disease. It is a new name if not a new thing. He has not investigated it, but is under the conviction that anything that comes in contact with the mucous membrane would produce irritation. This subject leads us to be dental physicians; we want to do more than mechanical work. Some of the trouble comes from foreign particles. His wife had a gold plate, and the mouth had become diseased, though the plate was kept clean. He attributes it partly to friction. There is more from rubber than from other materials, except very base metals. Can't see how we can abandon rubber; many cannot afford gold. Considers rubber a blessing if it does not produce disease.

Dr. Forbes asked whether the teeth of the gentleman's wife are filled, and with what?

Dr. Cobb said they were, with gold and amalgam; but the filling had

no effect in producing the disease. The principal portion is in the center of the mouth.

Dr. Arthur had had little experience, but thinks there is more inflammation from rubber than from gold plates. Had cured one case by substituting gold. If the irritation proceeds from red rubber, it must be injurious. He moved a committee of three to make a chemical investigation of it. Carried; and Drs. Judd, McKellops, and Eames, of St. Louis, and Prof. Summers, of Nashville, appointed, to report next year.

Dr. Walker is surprised to hear gentlemen say they don't know, when the means of knowledge are within their reach. He could relate cases for two hours. Other materials do produce disease; but the rubber disease is different from the results of want of cleanliness. Spoke of a prominent physician about to abandon his practice, on account of a decline produced by a rubber plate, and which ceased when it was removed. The poison acts in minute doses; persons have taken one hundred grains of calomel and survived, but if it were divided into one thousand doses they would have been eaten up.

Dr. Redman. Until something better is found, we ought to say less against rubber. It is universally used. Considers it best for his patients, and therefore uses it. There is a difference in the manner in which it is vulcanized; also in the roughness of the plate. Thinks he has not seen much more disease from rubber than from gold. Attributes it to the heating and non-conducting properties of the plate; had seen a new whalebone plate produce disease. We cannot cry down rubber; people will have it. It interferes with the circulation by its closeness of fit.

Dr. Forbes. No one has spoken of the constitution of the patient. Some persons can take calomel with impunity; in New Orleans they once fed it by the spoonful; on the other hand, a few grains would prevent some persons from speaking for three weeks. He had made a plate of gold, one of rubber, and one of platinum for the same person, some of which could not be tolerated; others could. Electrical action may be produced from different metals. We should take this into account. If mercury salivates, don't wear a rubber plate. Had seen two instances in two weeks where the mouth was as raw as if peeled. A relative of his could not wear platina, but could wear gold. We speak of low-priced work as *cheap*; it is not so,—the best is the cheapest.

The subject was then passed.

The Chair appointed Drs. Arrington, Walker, and Knapp as clinical operators.

The constitution was changed so as to require payment of dues from members only for the years when they were in attendance at the meetings.

A proposition to change the name of the association to the National Dental Association was laid over until next year.

The subject of deciduous teeth was then taken up, and a paper read by Dr. Judd, of which the following is an abstract:

Although the importance of the mastication of food by adults is admitted, we lose sight of it in reference to the deciduous teeth. There are a variety of opinions and practices in this respect. If permanent teeth are important organs needed for the health of the individual, there is no reason why the same results should not attend the loss of the temporary as the permanent. During seven or eight years, when the child is dependent on these teeth, the nutritive process is more active than at a later period, as the tissues have then not only to be supported but formed. The health is dependent upon mastication and upon the condition of the dental organs. Sensitive and aching teeth can but partially masticate, and that with inconvenience and pain. The premature loss of the deciduous teeth affects the health and development of the child. We have only looked at the subject as if the tooth could be painlessly removed; but the pain of extracting a deciduous tooth before absorption of the roots can be but little less than that of removing the permanent. Is it any object to save the child the horror of this experience? But extraction usually follows days and nights of toothache. Anæsthetics may be suggested, but would hardly be recommended, except in case of pressing need. But, if used, they would not compensate for loss of the teeth.

The influence of this extraction upon the permanent teeth has given rise to discussion, and a diversity of opinions is expressed. If premature, they are less likely to assume their proper place. The temporary teeth are imbedded in the jaw and crowded for room. Their regularity depends upon the development of the jaw. Some claim that an absorption will take place, the jaw being reduced in size, and irregularity necessarily ensues; others that though this might not be so, yet bony material would be withdrawn from the blood to be deposited in the socket, which would probably have otherwise been used in development. Authors and discussions are divided upon this point; Tomes and Gross stand against Wedl and Garretson.

It is established that these teeth should be carefully preserved, and inquiry will arise as to the best means to accomplish this result.

First, perfect cleanliness is essential. Parents should have the necessity clearly pointed out to them. The teeth are often filthy when perfect cleanliness is observed elsewhere. If observed here, other operations will often be unnecessary; but when the interference of a dentist becomes necessary we must do what we wish with as little pain as possible, that our little patients may not shrink from future contact with the chair. Carefulness and kindness will accomplish this. These

teeth as a rule are not sensitive, but if they are, and cavities cannot be properly shaped, it is better to temporize than to use force. On proximal surfaces the file may be used, and if polished and kept clean no filling will be needed. The age of the child will enable us to calculate upon the time during which the tooth will be wanted, and we can modify our operations to correspond. The use of adhesive gold, or gold in any form, will often be attended with difficulties, and produce an amount of pain which would be barbarous.

Soft gold, if any, should be used, and a plastic material will often be required. These teeth, we reiterate, should be saved; first, because they are needed for daily use; second, because we shall thus prevent a great amount of pain and sickness; and third, because the nutritive processes will be carried on better, and the health, growth, and development of all parts will be better attained, and a salutary influence will be exerted upon the permanent teeth.

The subject being open, Dr. Walker thought we paid too little attention to the denture as an element in digestion. This process is vitiated unless it is complete. In his section there is a lamentable deficiency of the tooth-producing elements; there is no more important topic than the best method of supplying the lime-salts. Furnishing lime-water might be beneficial. He was at first impressed with the idea that the lime should be in an organized form, but has found lime-water to produce a material change in the teeth in a few months. The idea that a tooth once made was made forever was a fallacy; he had seen cases where the salts had been removed, become restored and hardened.

Dr. Arthur. A good deal depends on our influence over our patients. Parents regard deciduous teeth as trifling. Their preservation is more easy than that of the permanent. In many cases removal of decay stops it: young patients will submit to this. We must impress upon parents the necessity of early attention.

Dr. Morgan. The evils of the loss of the first teeth are more serious than those following the loss of the second, and are never repaired; the checking of development is probably never overcome. The pain of extracting the molars is greater than of permanent teeth; the roots are longer and more spread. When the incisors are lost at an early age, the nutritive material is lost, and the process is thickened and rounded, and irregularity is produced. When one has been lost, the permanent tooth will lap and form a V shape. If the dentist can control the case he can preserve the teeth till the roots are absorbed. Use the file, chisel, or disk, with impunity; the dentine is not very sensitive, and does not decay afterward in nineteen cases out of twenty if opened widely and polished.

Dr. Johnston has made it a point for years to engage the affections of the child, and has little difficulty in performing all operations neces-

sary. His efforts in this direction have afforded him the greatest gratification in his practice; mothers who were his patients when children now place their children in his hands and tell him to do as he pleases; opens every space except between the six lower teeth, and finds that the arch is more regular. The greatest difficulty is to get people to appreciate our efforts; spends hours convincing patients of the importance of saving the temporary teeth, but it is like wheat sown on stony ground, though many cases are pleasing and profitable. We spend too much time on fancy operations. He would never fill a tooth if he could prevent the necessity.

Professor Knapp commended the paper, and coincides mainly with it, but does not agree with those who separate teeth whether decayed or not. Is doubtful as to the benefits of lime, unless administered in an organized form. When a tooth is devitalized care should be taken to extract at the proper time, as absorption does not then take place.

Dr. Walker takes care that the separations shall be so made as not to close together afterward.

Adjourned.

Evening Session.

Dr. Morgan protested against the plan of separating all except the lower front teeth, when sound; it is subjecting a child to the torture of treatment when there is no disease. The whole need not a physician; and it is a sin against humanity to destroy so large a portion of the tooth when disease is not present. It was claimed to prevent decay; but the days of inspiration are passed, and no man can foretell what teeth will decay; changes of place, of constitution, or even death may prevent. When sick, take physic; but when not, it is radically wrong. The tendency of temporary teeth is not to come together but to separate; and they do not need to be prevented from coming together.

The executive committee reported the names of Drs. Park and Chase, of St. Louis, for membership, who were duly elected.

Dr. Cobb. This is an important subject; we should commence with children's teeth, get them interested in their teeth, and in half a century we shall get the entire community to regard their teeth, and shall then take our proper places as dental physicians. If we educate as we should, each generation will improve. If he had any hobby it would be to get people to appreciate teeth. We should spend more force in that direction. He cannot see the propriety of separating before decay occurs. Though we can tell something about teeth even before their possessors are born, he would not file before the decay occurs; still if we wait we often lose the tooth. They must be taken in hand early.

Prof. Knapp. We must go back to first causes; the character of teeth

depends on the character of the materials of which they are made; the mother should be supplied with such food as contains lime salts, cracked wheat, etc. The first two stages of dentition are important periods; then the lime salts are taken on, and there should be a proper supply of food for pregnant females. He entered his protest against separating sound teeth of children; though the practice is good when decay has occurred. We should be influenced by good judgment, and the treatment should depend on the period at which the decay occurs. If only a year before loss of the teeth, there is no use in undergoing the trouble and expense; while if several, nothing could be more justifiable. A firmness of purpose and a quiet gentle manner will enable the child to endure what is for its own good. The material for filling might be amalgam, os-artificial, or gold, which is preferable if the tooth is to last long. Os-artificial will not last as long in children's teeth as in adults'. When the pulp is exposed it should be preserved if possible, but if diseased our efforts will be futile, and it would be better to devitalize at once; fills roots with oxychloride.

Dr. Freeman. More care as to cleanliness will produce less liability to decay. The effect of separating will be to impress the mother with the idea that something has been done which will prevent decay, and she will pay less attention to them. It would be difficult to decide when a tooth will be lost,—would fill if firmly implanted.

Dr. Judd. There are few children but can be handled in the chair without great difficulty. The first point is the great point; the child is frequently much alarmed, and he finds it best simply to rub the teeth with a smooth instrument or wipe off with cotton as the first operation; and thus gains its confidence. Where the pulp has suppurated, destroys it, and fills roots with oxychloride. It is impossible to remove all the soft tissues. Oxychloride mummifies the pulp, and it remains so for years.

Dr. Cobb. Dr. Judd's treatment is admirable. We should be truthful and not deceive. Had known patients who had been deceived to cross the street for years to avoid passing a dental office. You must handle them right, and by-and-by you can do what you wish. Oxychloride is a strong application; it destroys the gums and probably cooks the pulp alive.

Dr. McKellops. These things are interesting to hear, but hard to practice. It don't cost much to talk, but when a child comes with a swollen face, nervous from loss of sleep, and with pulps exposed, this thing spoken of can't be done, and he would like to see it done in a clinic. We do not get hold of the child when prevention can be used, nor can we perform thorough operations for them; it's as much as we can do to do it for grown persons. Would not cut sound teeth, but those that indicate decay. There is no telling where decay will occur.

In the same families some will have perfect teeth, while others will have defective. Floss silk, etc., will do to talk about, but mothers have no time to attend to the mouths of four or five children. How many grown persons do you find with whom you can find no fault as to cleanliness? If care is not taken afterward, fine work will not stand. It is well enough to talk about educating forty millions of people. There are cases which can be managed as the gentlemen say, but they are rare, and he will go anywhere to see a clinic on the subject. A child that comes to you almost in spasms cannot be managed so easily.

Dr. Knapp. This is too high a coloring to the difficulties; in most cases we can control our patients; there are all sorts, but where things are taken on an average the difficulties can be overcome. There should be no deceit. If we manage with firmness, truth, and quietness, we can do it.

Dr. Cobb. Dr. McKellops discourages us. We can do this thing and must do it, and I dare say the gentleman can and does do it. It is difficult and a hard road to travel. We should keep on and educate parents to understand the subject, and recognize our proper claims; we must make ourselves dental doctors and we are bound to be recognized.

Dr. Walker. The man who makes up his mind to do his duty must cast bread upon the waters. It is most important to educate mothers; he finds benefit from distributing a pamphlet containing information. He tells mothers that they should attend to their children's teeth first, and *then* say their prayers, attend to their toilets, etc. Has got through separating teeth with files, but is grateful to Dr. Arthur for giving us a method whereby the teeth are made to brace each other. Some arrangement is required by which the disk may be run in the plane of its axis.

Dr. Judd understands the difficulty, and it arises from the impression that every operation must be a perfect one, which is sometimes impossible. Sometimes these teeth are sensitive, though rarely. In such cases a simple filling of oxychloride, if it only lasts a week, will do a good deal toward reducing the sensitiveness. Nearly half his patients are under ten years, and he has less difficulty in getting them there than with others. In the last fifty cases he was sure there were not three in which he had not accomplished all he wished.

Dr. McKellops. A thorough operation cannot be performed in one case in one thousand. He uses Hill's stopping and oxychloride, but no amalgam. Has them come every month, and by-and-by a thorough operation can be performed. He desired to be told how to operate in cases where the teeth are all decayed at three years.

Dr. Arthur is surprised at Dr. McK.'s difficulty. Children are of course very different in character; but if the first difficulty of familiarizing the child with the operation can be overcome, the rest is not so dif-

ficult. The preservation of the temporary teeth, if taken at an early period, is a simple matter; but if permitted to decay, so as to require filling, it is more difficult. They may not be so sensitive, but children cannot bear pain like adults. If you separate, you take the chance of preserving without a painful operation, and if it fails you have done no harm. If the pulp is exposed, the operation is not necessarily a painful one; the only pain is from the arsenical application. Intelligent mothers who have suffered themselves will readily consent to the expense and trouble of preserving the temporary teeth of their children; but the great mass of the people don't think, and can't be made to reason, and we can do no more than exert all possible influence upon unreasonable people. There is a great deal in our power in this direction, and we should hold it to be a duty to do all we can.

Subject passed.

The subject of irregularities,—causes and treatment,—was then taken up.

Dr. Knapp said some of the causes had been touched upon. Premature extraction leads to contraction of the jaw. On the other hand, too long retention causes irregularity, especially if the tooth is devitalized, so that absorption does not occur. Roots retained also offer obstructions to succeeding teeth. In regulating, our pressure must be applied so as to bring the teeth into places they should occupy, and we must not allow occlusion to counteract it. It is more difficult to draw the teeth in than to push them out, and harder to keep them in place afterwards. They must be held there long enough to allow a deposit of bone to be made. If these principles be observed, almost any case can be managed. When plates are used they should come close to the teeth, otherwise the gum becomes inflamed; if it does, he touches it with nitrate of silver and iodine. Rubber rings should be so attached as to be prevented from slipping up on the necks of the teeth.

Dr. Walker spoke of a case where the teeth in the lower jaw had fallen back by reason of the loss of the six-year molars, so that the upper projected half an inch, while the teeth were so short that it was impossible to get a hold on them. He had used an appliance consisting of a stick across the front teeth, the ends of which were attached to elastics which went behind the neck, and succeeded in drawing the teeth back in three months.

Dr. Arthur. One great object is to obtain a fixed point from which you can exert your force. The jack-screw was recommended by Dr. Dwinelle many years ago, and is much used by Dr. Kingsley.

Dr. Morgan described the use of screws imbedded in a rubber plate, the heads bearing against the teeth, and being turned every day, thus spreading the arch. Spoke of one tooth which he had been entirely unable to move by any force he could apply, and gave it up.

Dr. Judd thinks something besides ingenuity is needed, and perhaps other things are more important. There are several varieties of irregularity; crowding by non-development of the jaw, and that from abnormal size of the teeth, would require different lines of treatment. When the natural position is merely aggravated, as it were, it may be termed a normal abnormality, and the treatment is different from a case where the teeth are out of the regular order and not so difficult, as in this case the tendency is to gain the natural position. Where the jaw is contracted between the bicuspidis it is desirable to expand the arch, but where the arch is perfect and the canines are excluded because the teeth are too large, you cannot desist from extraction, and do not wish to spread the arch. This is sometimes done, and an ape-like proboscis is the result. All our judgment is needed in this as in all forms of dental disease. Many have been mistaken as to the length of time required; the lateral incisors can be brought out half an inch in six days as well as in six months, in children of good health; does not believe, however, in torsion or instantaneous movement. It is sometimes good practice to extract when the arch ought not to be expanded.

Dr. Welchens spoke of a case of Dr. Kingsley's, where an incisor was moved out in six days in a patient forty years of age. Dr. Stellanwagen had practiced torsion in several cases with success.

Adjourned.

(To be continued.)

PENNSYLVANIA STATE DENTAL SOCIETY.

REPORTED BY JOHN MURRAY, D.D.S., ROCHESTER, PA.

THIS society held its sixth annual meeting in Wilkesbarre, Pa., July 14th, 1874, and continued in session for three days.

Geo. W. Klump, D.D.S., President; R. H. Moffitt, D.D.S., Secretary.

The meeting was well attended by representatives of the local societies. The first day was spent in ordinary routine business.

The following were elected officers for the ensuing year:

President.—Prof. J. H. McQuillen.

First Vice-President.—Dr. E. T. Darby.

Second Vice-President.—Dr. W. E. Magill.

Recording Secretary.—Dr. R. H. Moffitt.

Assistant Secretary.—Dr. J. E. Valentine.

Corresponding Secretary.—Dr. M. H. Webb.

Treasurer.—Dr. S. Welchens.

Board of Censors.—Drs. J. Murray, Louis Jack, C. S. Beck, Hill, and Green.

On motion, a committee of three, Drs. S. H. Guilford, R. Huey, and

E. T. Darby, was appointed to solicit contributions from the members for the "Barnum Testimonial." The committee subsequently reported one hundred and twenty dollars raised for that purpose.

Dr. Bonwill read a paper in which he proposed to form a Dental Protective Union of the United States, to which he proposes to transfer all patents for the mutual benefit of the profession and the inventors, and thus regulate the price and secure a fair remuneration to the inventor.

On motion, the paper was laid on the table for future consideration.

Dr. J. G. Ambler, of New York State Dental Society, gave a synopsis of the dental law in that State.

On motion of Prof. Peirce, a committee of five was appointed to procure a State law that would protect the citizens of this commonwealth against the impositions of charlatans, and, as far as practicable, regulate the practice of dentistry in this State. The committee consisted of Drs. C. N. Peirce, L. Jack, J. H. McQuillen, R. H. Moffitt, and J. Murray.

Dr. Jack stated that Dr. C. J. Essig had procured the Engle patent for the attachment of gum teeth to metal plates, and had presented it to the profession. Dr. Essig was voted the thanks of the society for his efforts in that direction.

Prof. Stellwagen opened the discussion of the subject of "Materials for filling Teeth." He was glad that the day had come when we could assert the right to judge for ourselves. Under certain circumstances plastic fillings are unquestionably superior even to gold, though claiming for gold the highest place under ordinary circumstances; prefers non-cohesive or soft gold; wants the members to give the old non-cohesive gold a trial; thinks it can often be more effectually and more rapidly used; thinks that tedious operations are sometimes productive of more injury to the patient than the loss of the tooth would have been; recommends highly the pink gutta-percha for temporary fillings; thinks it better than Hill's stopping. To make a gutta-percha for filling front teeth, he softens the sheets over warm water, and mixes white oxide of zinc in the gum to a proper consistency.

Dr. Darby uses oxychloride of zinc in the bottom of cavities; thinks it better than all gold; thinks a better filling can be made of non-adhesive gold; this gold can't be introduced or consolidated with a mallet; thinks great improvement has been made in the quality of gold foil; thinks there has been great deterioration in plastic materials.

Dr. Smith is not sorry that plastic materials have deteriorated; thinks common red gutta-percha is better than any plastic filling, will last as long as twenty of the other kinds; does not see how young practitioners are to exercise the necessary judgment spoken of by some in the use of amalgams. He gave it as the opinion of Dr. Flagg that red gutta-percha would last longer than gold under some circumstances.

Prof. Peirce put red gutta-percha fillings in teeth some years ago; saw them lately, and found them as good as when first introduced.

Prof. Smith filled a deciduous tooth with red gutta-percha; saw it two years afterwards, and found it as good as when first introduced. The instruments for introducing it ought to be slightly oiled. Dr. Flagg takes a little pure sweet oil on the point of his finger; he rubs the instrument on the oiled finger, and having softened the gum in warm water packs in piece after piece until the cavity is filled.

Dr. Bonwill thinks that red gutta-percha is the very best plastic filling; has had them in patients' mouths for six years; thinks it as good as gold.

Wednesday afternoon was set apart for clinics. Dr. Louis Jack filled a lower molar, using his electric plugger, and at the same time Prof. C. N. Peirce filled a very large upper molar,—crown filling. Both operations gave great satisfaction.

Wednesday evening Prof. McQuillen by appointment lectured before the society. The subject was "Dental Histology." After a terse general description of the tissues forming a tooth, the discourse was mainly devoted to the consideration of the structure and development of dentine. Attention was directed to the views of Leuwenhoek, Retzius, Owens, and Tomes, on the tubular structure of dentine; to the observations and experiments of Nasmith which led him to regard it as a fibrous structure; to the more recent investigations of Tomes, Kölliker, Waldeyer, Neumann, Boll, and others, relative to the dentinal fibrils and the sheaths of Neumann, and to the revival of the theory of the fibrous structure of dentine by Rufus King Browne. Passing to the development of dentine, cell-genesis and the formation of tissues from cells was carefully considered, with special attention to the cell-metamorphosis taking place in ossifying cartilage and in the dentinal pulp. The lecture was illustrated by a large papier-maché model of a molar tooth, kindly loaned by Mr. Crosthwaite; diagrams; a number of microscopical sections of the teeth, and a beautiful specimen of ossifying cartilage, showing the cells in various stages of development.

Cresson Springs was selected as the next place of meeting, the Executive Committee having the power to change to Altoona or Williamsport.

The Executive Committee was appointed, consisting of Drs. R. Huey, Robert Moffitt, J. Murray, C. N. Peirce, and S. H. Guilford.

Dr. Bonwill's paper was taken up, and on motion of Dr. Murray was referred by the chair to a committee of three. The committee reported favorably, but not having the time to fully consider the conditions proposed by Dr. Bonwill the committee was continued and instructed to report next year.

Essays on the "Treatment of Exposed Pulpas," from Dr. Ki-

Nashville, Tennessee, and from Dr. Charles S. Beck, on "Dental Therapeutics," were read and referred to the Publication Committee.

Dr. Guilford presented a plan of regulating teeth by simple appliances that will not take up much room in the mouth. He did the work in ten days.

Dr. Magill thinks ten days too short a time to accomplish a perfect cure.

Prof. Stellwagen thought ten minutes long enough, or perhaps three minutes. He twisted, in a few minutes, with the forceps, as recommended by Mr. John Tones, of England, two front incisors, for a young man nineteen years of age. They kept their positions, and needed no further treatment.

Dr. Magill believed that rotation may do where there is no curvature of the root, or where the root of the tooth is not much flattened on the mesial and distal sides; thinks that the changes in the shape of the arch, which we sometimes desire, cannot be accomplished by torsion as well as by slower processes.

Dr. Stellwagen thinks immediate torsion is as likely to change the shape of the arch as where it is performed slowly. It brings the long diameters together. Thinks that any dentist with proper skill taking hold of a tooth, and gently rotating it, will be able to tell if it has a curvature on the root.

Dr. Guilford does not believe in torsion; thinks Dr. Stellwagen could not have regulated the teeth he referred to by simple torsion.

Dr. McQuillen had no experience in torsion, but was encouraged by the successful results of Dr. Stellwagen's cases to try it; thinks there is danger of causing the death of the tooth, unless the patient is quite young; agrees with Dr. Magill in the view that torsion was only applicable to teeth whose roots are conical in form, as in the superior central and lateral incisors; where the upper portion of the root is bent almost at right angles to the rest of the tooth, as is not unfrequently the case in the laterals, that part would be very likely to break off in an attempt at torsion.

Dr. Stellwagen believes there is not so much danger of the death of the tooth as many would suppose. He once, in twisting a tooth, had it drop in the beaks of the forceps. He immediately replaced it,—the vessels were not broken. The tooth became fast in a few days, and occupied the right position, and retained its color perfectly. Answered to a question, When should torsion be practiced? while the bones are spongy, before the patient gets too old, though in some persons a tooth can be moved easier at thirty than in others at twenty. To a question, the doctor answered he never lost a pulp by the process.

Prof. D. D. Smith was appointed a delegate to the Ontario (Canada) Dental Association.

Prof. McQuillen, the president elect, on taking the chair made some very pertinent remarks. After thanking the members for the honor conferred, he said: In accepting the office I shall endeavor, to the best of my ability, to discharge its duties without fear or favor, enforcing as near as possible a strict observance of the rules, with the view of securing a prompt and speedy transaction of business, so that the objects of the society may be the more effectually accomplished. Coming, as we do, from distant parts of the State to confer together upon matters in which we are mutually interested, the value of time cannot be too highly estimated. By an orderly and methodical use of it in the consideration of subjects relating to education, theory, practice, or ethics, much may be effected in advancing the true interests of the profession; while in the admission and discussion of irrelevant matters, time is wasted, the patience of the members exhausted, and the society suffers in the estimation of the profession and of the community. Never was there a time in which there was greater need for a profound recognition of these facts than now. Calling into question, as some have done, the right of our specialty to be regarded in the light of a profession, the best and most effective answer that we can give to this is, to prove ourselves professional men by our *works*, rather than by responding to such attacks and engaging in a useless war of words. Let us dedicate ourselves with renewed and earnest devotion to our legitimate and appropriate work.

It is to be hoped that each gentleman who has promised to prepare a report on the subjects selected will bear this in remembrance, and come next year laden with the rich results of original investigations, or offer some improvement in practice, or submit a clearer and more comprehensive presentation of old truths in theory or practice than has been given heretofore to the profession. In this way, and in this way alone, can we expect to be recognized as men of science, and maintain for our specialty the rank of a liberal profession.

THE DENTAL SOCIETY OF THE STATE OF NEW YORK.

THIS society commenced its sixth annual meeting in the assembly chamber of the capitol at Albany, June 24th, 1874.

The meeting was a very harmonious and pleasant one, though not as large in point of numbers as is usual. Dr. J. G. Ambler, of New York, the president, presided. Papers and essays were read as follows:

"Dental Education," W. H. Atkinson; "The Histology and Nutrition of Deciduous Teeth," W. C. Barrett; "Preserving the Teeth," O. A. Jarvis; "Chemical and Galvanic Action upon the Teeth and Material used for their Preservation," S. B. Palmer.

The subjects of the essays were thoroughly and intelligently discussed.

The class for examination was smaller than usual, and from it but one person, Ira C. Curtiss, of Fulton, N. Y., was recommended by the State Board of Censors as having passed the requisite examination and entitled to the State society's diploma. The Board of Censors offered a resolution that the society appoint a committee to wait upon the legislature, and have the dental law so amended as to make it equally stringent with the new medical law; but upon consideration the subject was tabled for a year.

The Committee on Law reported the names of a number of dentists who were using degrees to which they were not entitled, and the society voted to commence proceedings against them for infringement of the law.

The following officers were then elected for the ensuing year:

President.—W. C. Barrett, Warsaw.

Vice-President.—L. S. Straw, Newburg.

Recording Secretary.—Charles Barnes, Syracuse.

Corresponding Secretary.—W. S. Elliott, Goshen.

Treasurer.—A. C. Hawes, New York.

Censors.—N. W. Kingsley, first district; C. A. Marvin, second district; S. D. French, third district; C. F. Rich, fourth district; S. B. Palmer, fifth district; S. H. McCall, sixth district; F. French, seventh district; L. F. Harvey, eighth district.

Permanent Members.—Charles Merritt, first district; W. T. Shannon, second district; A. S. Roberts, fifth district; B. R. McGregor, seventh district; W. C. Barrett, eighth district.

Honorary Members.—W. H. Waite, Liverpool, England; H. E. Knox, San Francisco, California.

ABSTRACT OF PROCEEDINGS OF THE ALABAMA DENTAL ASSOCIATION.

BY W. J. REESE, SECRETARY.

DR. WHEELER, of Mobile, read a paper on "Mechanical Dentistry," recommending thoroughness and a higher degree of skill. Considers gold and rubber in combination makes the best plate.

Dr. Keyes, of Montgomery, thought gold and rubber in combination the perfection of plate-work.

Dr. McAuley, of Selma, gave his experience in the use of celluloid base. Found it satisfactory. Was not willing to return to vulcanite so long as it is necessary to take out a license.

Dr. Dunlap, of Selma, in answer to the question, "What should be done for a patient so easily nauseated that he cannot have an impres-

sion taken?" recommended gargling the throat for several days previous with salt and water. Recommendation confirmed by others.

Dr. Keyes read an essay on "Erratic Abscesses," detailing two cases in which the suffering tooth was a sound one, and careful diagnosis revealed that an adjoining tooth was the producing cause.

From cases in practice, Drs. Deason, McAuley, Dunlap, and Rambo showed that pus may be deposited in the maxillary more or less remote from the cause.

A paper was read by Dr. Keyes on the use of "Pepsin and Iodoform in the Treatment of Teeth after Death of the Pulp."

Dr. Walker, of Montgomery, said that oxychloride of zinc was useless, except for capping nerves. It would wash out when exposed.

Dr. McAuley took issue, and advocated it as a good and safe filling in many approximal cavities.

Dr. Keyes indorsed its value. Thought Hill's stopping and tin valuable also in certain cases.

Dr. Dunlap approved of tin for approximal cavities.

Dr. Reese considered tin the best of all *cheap* material for approximal cavities.

Dr. William Crenshaw, of Athens, was elected a member.

Dr. McAuley related a case of the loss of the second molar, caused by the root of the dens sapientiæ overlapping the posterior root of the molar.

Dr. Keyes recommends the use of iodoform, introduced through the nerve-cavity and external fistulous opening in alveolar abscess.

Dr. Dunlap relies much upon the forcing power of a syringe, with the nozzle circled with rubber or cotton, to prevent regurgitation.

Dr. Rambo uses creasote as a disinfectant where the abscess has a fistulous opening. With cotton wrapped around the end of a small excavator, and dipped in creasote, he forces the fluid through the nerve-cavity and into the fistula. Making the excavator and cotton act as a piston, and the nerve-cavity as the barrel of a syringe, he "churns" until he is certain that the creasote has cauterized the entire fistula, judging by the white appearance at external opening of fistula, or by the warm sensation to the patient at the root of the tooth; he then fills root and crown at once. He fills root with gold, tin foil, or oxychloride of zinc, according to circumstances.

Dr. McAuley has used nitrous oxide gas with success, but finds occasionally a patient who cannot be put under its influence.

Dr. Wheeler related his experience in the use of nitrous oxide for three years; having administered it in many hundred cases. Did not urge its use in any case, and refused it to all patients who are disinclined to its use, either from fear or from any untoward effects after a partial administration.

The committee appointed to draft resolutions in regard to the action of Dr. S. S. White in behalf of the profession, reported as follows:

Resolved, That the thanks of this association be tendered to Dr. S. S. White for his manly fight against the rubber monopoly.

Report received and resolution adopted.

The following officers were elected to serve for the ensuing year:

President.—E. G. Wheeler, Mobile.

1st Vice-President.—W. D. Dunlap, Selma.

2d Vice-President.—H. H. Stevens, Montgomery.

Secretary and Treasurer.—W. J. Reese, Montgomery.

Adjourned to meet at Mobile, August 19th, 1874.

EDITORIAL.

THE ANNUAL CONVOCATIONS.

WE present in this issue the first day's proceedings of the Southern Dental Association. The report will be continued in the succeeding number, and the proceedings of the American Association and the American Convention will also be given. These reports occupy so much space that various other matters will necessarily have to be laid over for the present.

THE DENTAL COLLEGES.

WE present the following resumé of the announcements which have come to hand. Further details, terms, etc., will be found in the advertising pages of the DENTAL COSMOS.

Baltimore College of Dental Surgery.—Thirty-fifth annual session. Lectures will commence on the 15th of October, and continue until March. Graduates of the Baltimore College of Dental Surgery are required to attend but one session in several of the medical colleges of Baltimore.

Ohio College of Dental Surgery.—Twenty-ninth annual session. Lectures will commence on the 15th of October, and continue until March. Eight years' reputable practice, or a satisfactory examination upon the branches of the junior course in this institution, will be received as equal to one course.

Pennsylvania College of Dental Surgery.—Nineteenth annual session. The fall course will commence on the second Monday in September, and continue until the last of October, and will be free to those who matriculate for the regular session. During the fall session the dispensary and laboratory will be open daily for six hours, and one

lecture daily, except Saturday. The regular session will commence on the first Monday in November, and continue until the first of March.

Philadelphia Dental College.—Twelfth annual session. Dispensary and laboratory open all the year. Fall preliminary lectures will commence Monday, September 1st, and continue daily until November. The regular winter course will commence Monday, November 3d, continuing to the last day of February. The faculty give notice that after the session 1876-7, five years' practice will not be regarded as an equivalent for one course of lectures, and that attendance upon two full winter courses will be required of all candidates for graduation.

New York College of Dentistry.—Ninth annual session. Students may matriculate at any time, as the infirmary is open for regular students of the college during the entire year. The regular course of lectures will commence on Wednesday, October 14th, and continue until the first of March.

New Orleans Dental College.—Eighth annual session. Regular course will commence on Monday, the 23d of November, and continue four months. Graduation in medicine, or five years' actual practice, independent of pupilage, considered equivalent to a first course in this college.

Dental Department of Harvard University.—Seventh annual session. The required term begins October 1st, and continues nineteen weeks. The second, or spring, term, begins February 15th, and ends June 30th, and is designed to take the place of pupilage with private instructors.

Boston Dental College.—Seventh annual session. The regular session will commence November 1st, and continue four months. A certificate of attendance upon one course of lectures in any other reputable dental or medical college, or five years of reputable practice, may be considered a substitute for the first course.

Maryland Dental College.—Second annual session. Clinical lectures delivered during October. The regular course will commence November 1st, and continue until March. Graduates of this college will be received as second-course students at the Medical School of the Washington University, and at the College of Physicians and Surgeons.

Missouri Dental College.—We have not received the announcement of this institution.

MALPOSITION.

WE presume the malposition of the cut illustrating Dr. Truman's article in the August number of the DENTAL COSMOS has been credited by the intelligent reader to the compositor, and not to the author of the article.

OBITUARY.

DR. ELY PARRY.

DIED, at Lock Haven, Pa., April 19th, 1874, Dr. Ely Parry, in the seventieth year of his age. Dr. Parry was born in Lancaster County, Pa., 1804. He was a graduate of medicine, and practiced it in connection with dentistry. He held the chair of Chemistry and Materia Medica in the Philadelphia College of Dental Surgery during the existence of that institution.

He was a kind-hearted, conscientious man, and enjoyed the respect and esteem of those who knew him longest and most intimately.

DR. HENRY WINTERBOTTOM.

DIED, at Philadelphia, May 9th, 1874, of Bright's disease, Dr. Henry Winterbottom.

Dr. W. was born in England, November 5th, 1831. He graduated at the Pennsylvania College of Dental Surgery, in 1857. He succeeded Dr. James M. Harris in 1864. He had a very large practice, yielding for several years, without any assistant, from \$10,000 to \$16,000 per annum. He was a good operator, and won the confidence of his patients by his affability, and retained it by his integrity and skill.

THE LATE DR. HITCHCOCK.

At a meeting of the faculty of the dental school of Harvard University, President Eliot presiding, the following resolutions were adopted, viz. :

Resolved, That the faculty of the dental school of Harvard University have been deeply grieved at the death of their dean, Dr. Thomas Barnes Hitchcock, and in recognition of his character and services deem it their duty to place on record their regret for his loss and their sense of his merit.

Resolved, That in him the Harvard dental school has lost a valuable officer, whose unwearied and successful discharge of the duties of his professorship and unselfish interest in his work as dean entitle him to the respect and gratitude of all who are interested in the cause of dental education.

Resolved, That the dean be directed to communicate a copy of these resolutions to the family of the deceased, with assurances of our sincere sympathy in their bereavement.

THOMAS H. CHANDLER, *Dean*.

PERISCOPE.

IS DENTISTRY A LIBERAL PROFESSION?—I have elsewhere divided dental art into medical, surgical, and prosthetic. The two first connect it with the healing art, and demand a medical education; but the characteristic element of dentistry is its prosthetics,—just as therapeutics is the specific function of the physician. To remove diseased structure and replace it with gold,—to remove diseased organs and replace them with porcelain,—is the work which demands nine-tenths of the dentist's time; success in which gives him his reputation.

You may call the one operative dentistry and the other mechanical dentistry, if you choose; but each consists in a series of operations, and both are purely mechanical manipulations of material, by means of instruments; both, also, are acts of replacement. I think it, therefore, more exact and descriptive to subdivide the peculiar work of dentistry into—structural and organic prothesis.

Both are so difficult, that highest excellence in either department is rare, and scarcely ever do we meet with a "double first-class." Hence the practice of dentistry is itself subdivided, following the example of its parent art. But subdivision does not imply less honor in the pursuit, so long as we recognize, in preparation for it, the necessity of a knowledge of the whole art of which it forms a part.

This brings us to the only valid objection against the recognition of dentistry as a specialty of medicine. If it be true that dentists, as a class, have a more defective education than other specialists; if it be true that a large number of recognized members of the dental profession have no medical education whatever, there is good reason for this hesitancy.

Is dentistry, then, a liberal profession? Yes, certainly, if the majority of its members are men of liberal education. Medicine numbers among its practitioners very many half-educated and not a few wholly ignorant men. But such are not the men who to-day control that profession, or who, in the past, have given it dignity and reputation.

I have already intimated that dentists are too prone to spend in mechanical details time which should be given to study, and to adopt the popular error that a "mechanical turn" is the one grand element of success. It is indeed a *sine qua non*, without which the selection of the dental branch of medicine would be a sad waste of effort. But skill without education, art without science, cannot be called a profession,—I mean in the modern sense in which that term is applied to law, medicine, and the ministry.

How shall we separate from the mass of those who call themselves dentists such as may justly claim to be members of the profession of dentistry, and, by virtue of this claim, members also of the medical profession? This is the most imperative, as it is the most difficult, duty which to-day lies before this academy. Effort in this direction must be co-operative: it must also be harmonious.

Personally you are each responsible for your *individual* reputation; personally, however, you can do no more than add a unit to the *collective* reputation of the profession. But, by associate action, you can

decide who shall unite with you in establishing a general professional character.

Dental societies, associations, and academies have heretofore suffered other and less important objects to engross the hours of conference. Undoubtedly much good has been done by such meetings. But to what purpose do you improve the field of your labors unless you first inclose it, and have a well-guarded entrance? What harvest can be gathered on an open common?

Gentlemen, I call upon you, first of all, to establish your metes and bounds, and inclose your domain; for then, and only then, can you hope to reap the fruit of your toil. Then, with some hope of general adoption, can you frame a code of professional ethics, and encourage gentlemen to enter the profession by guaranteeing them the courtesy due to gentlemen. Then can you establish a higher standard of work than cheapness, and bring about a more generous rivalry than underbidding and defamation. For you well know that there is a large class whose actions, unnecessary to be here specified, greatly damage the character of the profession which it is your pride to honor. You must exclude or reform them—and that by no half-way measures—or you must fall to their level.—*Extract from Prof. Austen's Address before the American Academy of Dental Science.*

SPECIAL HOSPITALS.—You are doubtless aware that *special* hospitals (whatever objections may be raised to their existence) enjoy as a rule better opportunities for collecting a large number of cases together of the kind they profess to treat than falls to the lot of even the very largest *general* hospitals. They consequently are capable of serving, as, indeed, they ought to serve in some measure, as special focuses of information in their several departments.

They furnish exceptional opportunities for the selection of typical cases of the commoner forms of disease from among the large aggregation of individual examples that they are able to command, and equally they present an unusually wide field from which to collect examples of the rarer varieties of disease.

Now, an acquaintance with the commoner forms of disease is of obvious utility to us, and I may be thought to say too much if I allege that a knowledge of the rarer varieties is of scarcely less importance.

But I have often found that a slightly disguised example of a common disease is apt to be taken for some wonderfully rare complaint, because the name and the published description of such rare diseases are familiar to the diagnoser, while, nevertheless, he has never yet experienced an opportunity of becoming personally acquainted with the actual appearance that it presents.—*Dr. Balmano Squire, in British Journal of Dental Science.*

HINTS AND QUERIES.

WHILE assisting in filling the first left inferior molar, the patient complained so much of pain in the temples that operations had to be suspended for the time being. I ascribed it to pressure on the inferior maxillary nerve. Was I correct?

If two plugs (gold and amalgam) approximate, is it reasonable to think they may produce a magnetic current? Is not the presence of saliva sufficient under such circumstances to produce such a current?—W. T. C.

ADHESIVE GOLD.—When Dr. Driscoll wrote the article on this subject which appeared in the *DENTAL COSMOS* for June, he was evidently ignorant on some of the points referred to.

The use of adhesive gold is at present very unsatisfactory in the hands of the majority of English dentists; its use and treatment are understood by very few, and I may say the same with regard to American operators, when the fact is considered that out of ten plugs received by me from professors of American colleges only three were moisture-tight. As I have no authority to give the names of the makers of the latter, I will simply say that the original letters referring to these, with their descriptions and details, were submitted at the time to Mr. Matthew, of Edinburgh, and to the editor of the *British Journal of Dental Science*, in whose possession they are at present. The plugs themselves were, I believe, also forwarded to the latter gentleman before they were returned to the makers.

I had been working on the old system, which I had been taught. Finding it unsatisfactory, I raised an inquiry, and found others were in the same difficulty. After further experiments I found the remedy, and can now pack adhesive or sponge gold so as to be moisture-tight with the same expenditure of time as with tin or soft foil. As Dr. Driscoll does not need any information on this subject, I will not trouble him; those who do will find it in the *British Journal of Dental Science* for July.

It may be noticed that the rubber dam is rarely used here; the English, as a rule, object strongly to its use, and also to the very protracted operations which are common in America. There seems to be an essential difference in the nature of the people, and the majority of operations must be done quickly or not at all.

With regard to expanding amalgams, if Dr. Driscoll's age does not greatly exceed one hundred years, these were used before his existence became an accomplished fact. I can find one or two plugs now which were made with an expanding amalgam about fifty years ago, and which are doing good service at the present time. The old expanding amalgam, which consists of coin-silver filings and precipitated silver in equal parts, discolours badly. Mine does not. In addition to these, there are at least two other expanding amalgams in use. As mine is only number four as regards age, the discovery of this remedy can hardly be said to correspond, as it was known and used long before cohesive gold was thought of. The inquiry has been of use to many and an amusement to Dr. Driscoll. I should say that he ought, therefore, to be content, as he has had his share of the fun.—THOS. FLETCHER, *Fellow of Chemical Society, London*.

RECOVERING GOLD FROM SPITTOON-CATCHINGS.—If the contents of the gold cup are free from mats of cotton, roots, etc., it is ready to operate upon with acids at once; if not, it is best to remove all that is readily freed from adhering particles of gold, such as roots, pieces of plaster, etc., and then thoroughly dry it in an evaporating-dish until the cotton can be completely charred, using no more than sufficient heat. This can readily be accomplished by setting the dish in a warm place for a few days, and when quite dry pouring a little alcohol into it and setting it on fire.

Now place the mass in an evaporating-dish (or what is more handy, a glass flask), add say an ounce or two of strong hydrochloric acid and a small quantity of mercury, and boil gently ten or fifteen minutes.

By this process the organic matter is rendered soluble, and the fine particles of gold, with the tin and silver that may be present, are collected and taken up by the mercury. Wash the amalgamated mass repeatedly with water, until free

from all trace of acid, and at the same time remove all non-amalgamated impurities. This operation is facilitated by grinding up in a wedgewood mortar and adding enough mercury to make a very soft amalgam. Return this amalgam to the flask, and boil with nitric acid until the acid ceases to act upon it. This dissolves the silver and mercury, and converts the tin into the binocide or insoluble metastannic acid, which, with the gold, forms a sediment at the bottom of the vessel.

Carefully pour off the solution, and preserve it with the first four or five waters used in washing the sediment; it contains any silver that may be present, which may be recovered by the usual process of precipitating with chloride of sodium, etc. Great care is required in washing the sediment, to prevent loss. It is best to pass all that is poured from it through a filter.

When the sediment is freed from any trace of nitric acid by repeated washing, return that portion arrested by the filter to the flask, add an ounce or two of strong hydrochloric acid, and boil gently till the binocide of tin is entirely dissolved, and the pure gold remains ready for melting after being well washed and dried. I find it more economical to wrap this gold-dust in a sheet of foil or a piece of gold rolled thin, and melt it in a piece of crucible before the blow-pipe, if there is not more than a few dwts., than to use a crucible in the fire. As a rough estimate of the amount saved, I recovered about two dwts. of pure gold and a like amount of pure silver from the sediment collected in the gold box of my fountain-spittoon while I was using four ounces of foil, at an expense of about ten cents in acids and half an hour's time.—W. H. TRUMAN.

THE CELLULOID BASE.—I am still in the frequent receipt of letters from dentists residing in different parts of the United States and Canada, inquiring whether the favorable opinion of the celluloid base, expressed by me in an article in the *DENTAL COSMOS* of January last, has been in any respect modified by my subsequent experience with that article. I solicit space in your pages to say to all such that I have as yet had no cause to change my opinion of the merits of the new material, unless it be in the way of an increased confidence in its *durability*. The pieces which I put into the mouths of my patients ten months ago, so far as I have lately seen them, all remain unchanged, and I see no reason why they may not last for many years.

I find the manipulation of so beautiful an article a source of pleasure, and for this reason alone have been led into an increased devotion to the mechanical branch of practice. I use the steam apparatus, and consider it infinitely more pleasant than the oil. I use nothing but plaster casts, mixing my plaster as stiff as it can be worked, in which case it becomes equally or nearly as hard as the plaster-stone before it is calcined and ground, which is hard enough for all practical purposes. I keep my celluloid plate under a slowly-increasing pressure from a little above the boiling-point to the close, being careful not to apply a very hard pressure until the plate is heated to nearly as high a temperature as it will bear, and then give the piece plenty of time to cool; and my experience teaches that a failure need not occur where a reasonable amount of skill and judgment are used in the manipulation.—WILLIAM FISHBOUGH, *Brooklyn, N. Y.*

DR. FIELD, of Geneva, Switzerland, is preparing a list, for publication, of all doctors of dental surgery and medicine residing in Europe. He requests all dentists who have graduated in the States to send him, at their earliest convenience, their names, addresses, and date of graduation. Address Geo. W. Field, D.D.S., Bd. Helvetique, Geneva.

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ORIGINAL COMMUNICATIONS. DENTAL PATHOLOGY AND THERAPEUTICS.

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[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
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(Continued from page 460.)

FROM the "dental examination" stand-point, the necessary separation of the teeth should be performed with four considerations in view: 1st. The separations should be sufficient to admit of thorough inspection. 2d. They should be accomplished with a certain degree of promptness. 3d. The visits should be as few in number as possible. 4th. The process should be attended with as little irritation to the parts and inconvenience to the patient as is compatible with the previous requirements.

It will be recognized, upon reflection, that the presentation of these four considerations, and their adoption as guides, would form that combination which must tend to insure an acceptable success, and that thus a pleasing degree of self-reliance would soon be properly and substantially acquired.

It is obvious that we cannot discuss instrumental separation in this connection, for no one would resort to such an expedient for the sole purpose of examining the condition of a denture. We have then, first, rapid wedging.

This method of wedging has been about equally extolled and condemned by both practitioners and patients, and there is probably no operation in dentistry which would more continually evoke antagonistic opinions.

The extremes which we meet in the tolerance of rapid wedging are sufficiently excessive to fully explain why this is, for while individuals in whom the "lymphatic," "bilious," and sometimes "sanguine," *preponderates*, temperamentally, will permit the almost immediate separation of teeth by the use of hard-wood wedges, driven with the mallet, those, on the contrary, who have the "nervous" either as the basis or

largely a component of temperament, will sometimes not tolerate a minute of hard wedging by hand-pressure, much less the driving of the wedges by blows from a mallet.

In my experience I have frequently made several separations acceptably to the patient, for examinations, at a single sitting, and, for the reverse of this, I have *extracted several teeth*, for excessive discomfort which I was unable to relieve by treatment, and which dated from a "rapid wedging," either for the purpose of introducing a filling, or (in some instances) merely for the examination of the teeth.

Thus it is that the fourth consideration in regard to wedging should be the guide in the selection of rapid or moderate pressure as the means of accomplishing the desired object.

I cannot refrain from directing especial attention, even thus early in the consideration of special dental pathology, to the peculiar complication which we recognize as the "nervo-bilio-lymphatic" temperament. Even in the commonplace operation of separating the teeth, the trials, to both operator and patient, begin.

We find here the nervous susceptibility heightened; the strength of the bilious admixture unreliable from its lymphatic basis; and the whole dominated by characteristic inability for either resistance or recuperation.

By reference to the physiology of temperament, we shall find that persons of this class will be indicated by an admixture of seeming antagonisms; thus, the hair is not dark enough to class as bilious, but is too dark and wavy to be lymphatic; the skin is too dark and too vital to be lymphatic, and not dark or yellow enough to be bilious; the flesh is too solid for lymphatic, not firm enough for bilious, too exuberant for nervous; the sensibilities are strangely unreliable, pain being experienced when it is least expected, and exemption from suffering occurring when it is apparently most reasonable that it should supervene; the motor arrangements are equally unphysiological, for we are surprised at the ceaseless restlessness of the placid eyes, the rapid utterances of the soft, full lips, and the *quick* response on the part of *voluminous*, but not powerful, muscles.

Physiological characteristics such as these, we might suppose, would naturally produce pathological complications of exceeding peculiarity; such we shall find to be the case throughout the entire range of dental disease, and it is, as I have intimated, on this account that I now direct attention to it.

But it is by no means this class of patients only who will not tolerate rapid or powerful wedging, and thus we have been led to the use of, first, india-rubber or gum elastic,—this material has been employed for this purpose for many years. It was formerly used more generally than at present, though its comparative disuse has seemed to me to

have been due to an abuse of the material rather than to its proper use.

India-rubber is usually employed by cutting strips from sheets of varied thickness. The desirable size for any individual case being selected, the strip is stretched to thinness, and, having been drawn between the teeth, is then allowed to resume, as nearly as may be, its former thickness; the ends are cut off by scissors, and the elasticity of the gum soon demonstrates its power for separating the teeth. It works with strength, continuously, resistlessly; and thus, if used too thick, is frequently productive of great irritation about the teeth, and consequent great suffering to the patients.

It is this which they dislike, which they fear, and which is bad.

Therefore it is this which is to be remembered and avoided, for the material is too valuable in its use to be abused.

But again, there are many cases, perhaps a majority, in which even a mild power of india-rubber is a serious objection, from its *persistence*. Producing at first a marked and uncomfortable pressure, it continues thus until a tenderness is induced, which exercising continuously a sensory irritation upon the patients, they are found less than normally capable of enduring the amount of pain which intervenes between this period of the process of separation and that at which the desired space has been gained.

Thus it is that many persons have exceedingly unpleasant recollections in connection with this method of separation, and receive with evident satisfaction the information that much more acceptable means can be employed for wedging teeth.

Soft wood—white pine, probably, in preference to any other—is usually the material resorted to for gentle wedging; and though it is found to be less prompt than rubber, it is, nevertheless, adequate to our demands, while the gain in comfort is reported as more than compensating for the loss in speed.

The wood is cut thin and wedge-shaped, the first piece, and perhaps the first two or three pieces, being introduced by the operator.

This is done by using a piece of wood sufficiently long and strong to admit of manipulation, and inserting it from the labial or buccal faces of the teeth, directing it toward the lingual faces. The projecting wood, within and without, is then cut off smoothly with excising forceps made for the purpose, or perhaps even more neatly with either a curved bistoury or penknife.

After the introduction of one, two, or three pieces of wood, if greater space is required, patients can, as a rule, continue the process for themselves, and thus obviate the necessity for numerous visits.

It is proper to caution patients against the use of matches for the purpose of wedging teeth, not so much on account of the *probability* of

danger from phosphorus upon the wood, as the *possibility* that serious trouble might ensue should any unfortunately be introduced through carious teeth or abrasions of gum-tissue.

In some instances it is found that teeth are so closely in contact and so firmly set that wood has to be cut so thin as to be almost useless at first, if, indeed, it can be inserted at all. In such cases a very thin piece of india-rubber may be advantageously employed for a few hours, or possibly a day or so; after which an easily-introduced wedge of wood will retain the acquired space for further wedging, and at the same time permit of the sufficient return of the parts toward normality to insure the promised exemption from pain; or, again, a very small piece of cotton-wool may be first inserted, which, though it will not accomplish as much as india-rubber, will do enough to permit the commencement of wooden wedging.

It is not in place at this time to continue the subject of wedging, with remarks upon the conditions which entail the choice, and, indeed, necessity, for employing other materials and other forms of wedges, for it is to be remembered that we have only reached that point at which we are separating teeth for the purpose of deciding as to the existence or non-existence of caries. If, however, we have by this means discovered that disintegration of enamel tissue has taken place, and that, although no cavity of decay has yet been formed, it is, nevertheless, needful that measures should be taken to insure the future welfare of the affected organ, we have for *treatment* that form of dental disease known as

Superficial Caries.—It is my decided opinion that we have in this connection that discussion which marks the practitioner of dentistry as one of broad views; of extended acquirements, both general and special; of ample grasp of subject; of wide remedial range, systemic as well as local, therapeutic as well as manipulative, and, therefore, a man of exceeding usefulness; or, on the other hand, that man of little worth as a reliance, whose only realization is that of the presence of decay; whose only mental discussion is as to the advisability of waiting further development, or proceeding to immediate operation; whose only doubt in the acceptance of the latter is as to the relative advantage of drilling a cavity and filling, or removing the diseased portion, together with sufficient tooth-structure to prevent recurrence of caries by the establishment of a self-cleansing surface, and whose only debate in accepting the last is as to the employment of chisel, disk, or file; and if the file, as to whether it shall be flat or half round.

These are the considerations which have, and which do yet, almost exclusively occupy the attention of the dentists, even of the present; and it is the uncertainty of the results, the frequency of the failures, the vagueness of such comprehension of condition that impels me to urge

the importance of the constant remembrance that the local lesions which we are called upon to treat are but the expressions of that systemic condition which, unnoticed, disregarded, and maintained, will bid defiance to our finest local efforts, and bring discredit upon the practice of one of the best of specialties.

For this reason I may be permitted to ask renewed perusal and study of the more advanced magazine-articles of recent issue upon this subject, the views of the latest-accepted text-book (Garretson's "Oral Surgery"), and the suggestions which I have already offered in this connection when upon the subject of dental caries.

It is now, also, that we may find the first of those concomitants to caries which, in addition to recognition of systemic conditions, will not only demand *peculiarity* of instrumentation, but oftentimes the additional use of remedies locally, which forms the therapeutics of that department of dentistry which is technically known as

Treating Teeth.—It is no unusual thing to find locations in which dental caries is markedly pronounced, and yet with no undue response from any ordinary irritant; nor is even the severe test of thorough excavation, preparatory to filling, sufficient to produce any serious discomfort to the patients; and yet, again, it is no unusual thing to meet with instances in which even less than the minimum grade of *perceptible* caries is sufficient to occasion more or less inconvenience. This condition is known as

SENSITIVE DENTINE.

First Cause of Odontalgia.—I have said that this condition, which is the first real preventive to comfortable operating, may exist in connection with less than the minimum of *perceptible* caries.

The *locations* in which this occurs will usually be found at the necks of the teeth, which are seen to be denuded, possibly, though not necessarily, but very slightly, and with no perceptible evidence of caries; or, again, in sulci, generally upon the articulating faces of teeth, but so perfectly close as to defy the observation of any carious condition; or, again, upon the cusps or cutting edges of teeth which have been worn by mastication, and are, consequently, perfectly smooth; or, again, finally, within cavities of decay, both small and large, *just under the enamel*, most decidedly, and therefore associated with the sub-enamel membrane, but sometimes extending over the entire surface of exposed dentine.

(To be continued.)

THE FACIAL REGION.

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PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 455.)

THE PHARYNX.

THE pharynx is a muscular pouch or bag bounded posteriorly and laterally by the constrictor muscles, and superiorly by the base of the skull. It has no true anterior boundary—through its anterior limit—at the plane of the pterygo-maxillary ligament. The parts in front of this ligament constitute the oral region,—bounded laterally by the buccinator muscles,—the parts behind it lie within the pharynx. It is thus seen that the palate is within the pharynx.

The pharynx is widest at the line of the production of the hard palate backwards; it is narrowest below at the cricoid cartilage. It communicates with the mouth and nose in front, the larynx and œsophagus below, and the Eustachian tubes at the sides. Behind the latter is a depression called the fossa of Rosenmüller.

(1) *General remarks on the pharynx as inspected in the living subject.*

The *soft palate*, while within the pharynx, is so intimately involved in important functions that a separate statement concerning it is necessary. The soft palate, as defined long ago by Cuvier, is a musculo-membranous valve suspended to the posterior border of the palatal ledge, and elevated toward the posterior nares at the moment of the passage of the food from the mouth.

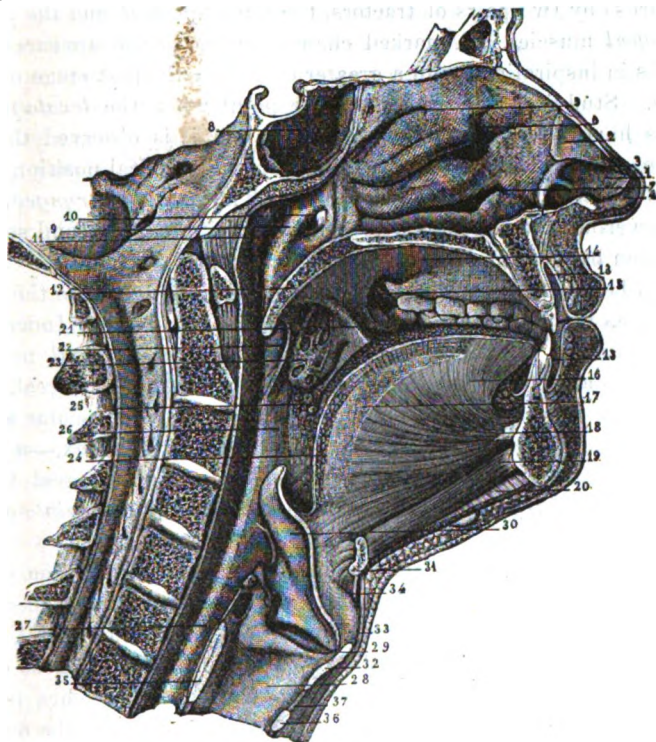
The soft palate presents for examination two surfaces: antero-inferior (glandular), presenting toward the oral cavity; the second, postero-superior, within the naso-pharynx.

The valve-like function of the soft palate is performed as follows: The *levator-palati* muscles,—power, short,—pull it upward and backward.* This action is the most important feature to study in the soft palate. The muscles are at all times sufficiently pronounced to project into the pharynx as a pair of thick pillars covered with a delicate red mucous membrane. These pillars may be called the *salpingo-palatal* folds. They extend from in front of the orifice of the Eustachian tube downwards and inwards. They are always conspicuous objects in the image of the rhinal mirror, and in conditions of turgescence may obscure the

* The upward and backward traction of these muscles causes the great breadth of the congenital fissure of the soft palate, and, as is well known, the muscles are divided prior to the performance of staphyloraphy. It has occurred to us that in early infancy, when an attempt at staphyloraphy would be unjustifiable, much could be done to preserve the soft palate in good condition (i.e. prevent widening of the fissure) by one or more thorough divisions of the muscles in question.

view of the posterior nares. In the introduction of the Eustachian catheter, the involuntary contraction of these muscles may be sensibly felt on the shaft of the instrument.

FIG. 35.—VERTICAL SECTION OF THE FACE AND NECK, THROUGH THE MEDIAN LINE ANTERO-POSTERIORLY, EXPOSING TO VIEW THE NOSE, MOUTH, PHARYNX, AND LARYNX.



1, oval cartilage of the left nostril; 2, triangular cartilage; 3, line of separation between the two; 4, prolongation of the oval cartilage along the column of the nose; 5, superior meatus of the nose; 6, middle meatus; 7, inferior meatus; 8, sphenoidal sinus; 9, posterior part of the left nasal cavity, communicating with the pharynx; 10, orifice of the Eustachian tube; 11, upper extremity of the pharynx; 12, soft palate, ending below in the uvula; 13, interval of the mouth between the lips and jaws; 14, roof of the mouth, or hard palate; 15, communication of the cavity of the mouth with the interval between the jaws and cheek; 16, tongue; 17, fibrous partition in the median line of the latter; 18, genio-glossal muscle; 19, genio-hyoid muscle; 20, mylo-hyoid muscle; 21, palato-glossal fold; 22, palato-pharyngeal fold; 23, tonsil; 24, base of tongue; 25, infra-tonsillar glands; 26, 27, pharynx; 28, cavity of the larynx; 29, ventricle of the larynx; 30, epiglottis; 31, hyoid bone; 32, 33, thyroid cartilage; 34, thyro-hyoid membrane; 35, 36, cricoid cartilage; 37, vocal membrane.

The muscles acting upon the soft palate from beneath are much less significant than the foregoing, though forming conspicuous folds during the oro-pharyngeal inspection. These folds are usually known under the names of the half arches of the palate. We believe a decided

advantage may accrue by ignoring this name, and substituting for the so-called anterior half arch the name *palato-glossal* fold, and for the posterior half arch the name *palato-pharyngeal* fold,—the muscle beneath each suggesting the name.

These folds can be best studied when the soft palate is at rest, as in expiration. It is now held in its position (obliquely downwards and backwards) by two pairs of tractors, the *palato-glossal* and the *palato-pharyngeal* muscles. A marked change occurs in the appearance of the folds in inspiration, or in a greater degree in the first stage of deglutition. Studying this process at the point when the *levator-palatal* muscles have already firmly raised the palate, it is observed that the *palato-pharyngeal* are now thrown into a nearly vertical position along the postero-lateral border of the pharynx. The *palato-pharyngeal* muscles answering to these folds by contracting, initiate the second stage of deglutition by elevating the pharynx toward the fixed point.

It will be seen that the chief use of this muscle is to elevate the lower pharynx, as the *levator palati* is to elevate the soft palate. Indeed, the only depressors of the palate are the small *palato-glossal* muscles, whose folds are placed well in advance of the *palato-pharyngeal*.

The purposes of the soft palate require extensive muscular attachments, extending along the entire length of the pharynx,—a nasopharyngeal tractor in the *levator-palatal*, an oro-pharyngeal tractor in the *palato-pharyngeal*, and an oral tractor in the *palato-glossal* muscle.

The uvula is an appendage apparently to the median line of the posterior border of the soft palate. It exists only in man and monkeys. It is a symmetrical teat-like organ; containing, as in a finger-stall, a pair of minute muscles, the so-called *azygos uvulæ*. At the close of the second stage of deglutition the uvula contracts, and becomes in consequence transversely wrinkled, most probably to plug up the opening which otherwise might exist during the elevation of the palate between the posterior margin of the soft palate and the posterior wall of the pharynx.

In our remarks on the region before us the following terms will be used :

The portion of the pharynx below the soft palate is termed the *oro-pharynx*, as that portion above the soft palate is the *naso-pharynx*. The space between the *palato-glossal* folds laterally and the uvula superiorly and the dorsum of the tongue inferiorly is the *oro-pharyngeal orifice*. The space between the *palato-pharyngeal* folds and the uvula is the *naso-pharyngeal orifice*. The space between the *palato-glossal* and *palato-pharyngeal* folds on either side is the *tonsillar space*. The space between the tonsillars is the *inter-tonsillar space*.

All these technical terms are descriptive of planes across the axis of the mucous tract, excepting the tonsillar spaces, which are lateral.

It will be noticed that the word *fauces* finds no place in this terminology. Nothing but confusion can arise from the use of a term such as this, and it is better in consequence to avoid it.*

The mucous-membrane lining the pharynx is in close union with the base of the skull and the orifices of the Eustachian tubes above, and on the posterior surface of the cricoid cartilage below. Along the posterior wall the membrane, on the other hand, is very loose, and permits a quantity of exceedingly delicate connective tissue to lie between. In front, the mucous membrane is continuous with the nasal passages and mouth, presenting features distinguishing the membrane in these localities.

Racemose glands are conspicuously developed on the anterior aspect of the soft palate, and, in a less degree, upon the posterior pharyngeal wall. The closed glands are met with on the roof of the pharynx and at its postero-superior junction (pharyngeal tonsil). The most remarkable example of aggregation of bodies of a closed-gland type are the *tonsils*. Each of these two organs is of an almond shape, somewhat flattened on the outer fixed surface but convex on the inner. Between the tonsil and the base of the tongue a number of small bodies of the same character are seen, which may be termed the *infra-tonsillar* glands. The *fovea ovalis* is a term proposed by Tourtual† to express the non-glandular space existing between the lower border of the tonsil and first infra-tonsillar gland.

* It would be a thankless task to examine the synonymy of the word *fauces*, as employed by teachers and practitioners. It may fairly be stated that the term has been applied to almost every part of the mucous tract lying between the palatal bone and the œsophagus. A very common belief is entertained, that the *fauces* is that part of the pharynx and soft palate, which can be seen when the mouth is open,—a conception justifying the student, who in response to the question, "Where is the *fauces*?" placed his fore-finger far within his open mouth and "guessed it was somewhere in there."

We learn from Innes' "Description of the Human Muscles," a book which embodies the teachings of the elder Monroe, that in 1777,—the date of the publication of the book,—the Edinburgh plan of teaching was to consider the *fauces* the same as the naso-pharynx, restricting the pharynx to the lower part of the oropharynx.

The passage is as follows: "The common opening between the anterior arch may be termed *fauces*, or *top of the throat*, from which there are six passages, viz.: two upwards, being one to each nostril; two at the sides, or one to each ear, called the Eustachian tubes; two downwards: the anterior is the passage through the *glottis* and *larynx* into the *trachea*, which terminates in the lungs; the posterior is the largest, named the *pharynx*, or *top of the œsophagus*, which leads to the stomach."

† Neue Untersuchungen über den Bau des Menschlichen Schlund, etc., 1846.

Glands are more abundant in the naso-pharynx than in the oropharynx.

(2) *The Pharynx as studied by Dissection.*

The constrictor muscles form (with aid derived from the pharyngeal aponeurosis) the frame-work of the pharynx. They form the lateral and posterior walls of the chamber, and are three in number: the *superior*, *middle*, and *inferior*. Without entering into an elaborate description of these muscles, which would be foreign to our object, we may briefly anticipate that they are arranged in a lamelliform manner to one another,—the inferior being the most exposed from behind and overlapping the middle, which in turn covers in part the superior.

The *superior constrictor* arises from the hamular process of the sphenoid bone, the pterygo-maxillary ligament, and by a small slip from both superior and inferior maxilla. Hyrtl in addition gives a slip from the side of the tongue as well. The muscle is inserted into the raphé upon the posterior surface of the pharynx. The upper free border of the muscle hangs like a curtain-edge between its outer and posterior points of attachment. The function of this muscle is obscurely understood. It must assist the action of the other constrictors, according to the law that of a natural group of muscles the one nearest the source of nerve-supply will contract in advance of others more remotely placed. It may also aid the purchase of the buccinator in making tense the pterygo-maxillary ligament.

The *middle constrictor* arises by two fascicles,—from the greater and lesser horns of the hyoid bone. Its fibers effect a fan-like dispersion to be inserted in the raphé.

The *inferior constrictor* arises from the sides of the thyroid and cricoid cartilages, whence its fibers pass to be inserted in the raphé. These two muscles are the most effective of the constrictors, and are efficient by involuntary contraction in forcing the bolus of food through the narrow orifice of the œsophagus.

The pharyngeal aponeurosis is a firm layer of fibrous tissue placed between the muscular and mucous layers. It arises from the pharyngeal spine of the occipital bone, and is inserted into the petrous portion of the temporal bone where it is lost in the fibro-cartilage occupying the middle lacerated foramen. It seems to strengthen the pharynx at this point, but gradually diminishes as it passes downward, and is not discernible beyond the pharyngeal limits.

A second fibrous layer belonging to this region is the palatal aponeurosis. This structure lies intermediate to the posterior free edge of the hard palate and the free portion of the soft palate. It is the fibrous part of this fibro-muscular valve. It is composed of delicate glistening fibers extending from about the hamular process of the sphenoid bone,

and expands from this point as a firm sheet of membrane. It receives at its side the tendon of the so-called *tensor-palati* muscle.*

The arterial supply of the pharynx is derived from inconstant twigs from branches of the external carotid, notably the ascending pharyngeal and pharyngeal branch of the facial. The veins are tributary to the facial trunks anteriorly, and to the internal jugular vein and post-cervical trunks posteriorly. Hence cupping at the nape of the neck may determine blood from the pharynx.

The nerves of the pharynx are derived from the glosso-pharyngeal and pneumogastric nerves, with branches from the sphenomaxillary ganglion.

(3) *Localization of Diseased Action.*

Our remarks under this head will be divided into—(a) oro-pharynx, (b) naso-pharynx, (c) the soft palate.

(a) *The Oro-Pharynx.*—The portion of the pharynx seen through the oro-pharyngeal orifice is often the seat of diseased action more or less distinct from the other divisions. This can be explained as follows: The palato-pharyngeal muscles take their origin here, and in contraction are seen exerting a powerful action on the lower half and posterior wall of the pharynx. It will be remembered that at the time of this contraction the soft palate is elevated, and the oro-pharynx, therefore, cut off from the naso-pharynx.

Now, in chronic pharyngitis there is often seen submucous infiltration about these folds, which often assume such proportions as to lead the incautious to mistake them for engorged tonsils. By the constant teasing and pinching that the space between the two muscles, when chronically inflamed, must be continually subjected to, sloughing—at this point extending through the entire thickness of the pharynx—is not unfrequently seen.

The palato-glossal fold is often pushed forward by an engorged tonsil, which may from the front view be more or less covered. As a rule, however, the fold is not adherent to the tonsil, but permits a probe to pass between with facility. But at times the fold becomes fixed, and may require division to overcome a distressing strangulation of the tonsil.

Persistent inflammation often lingers about this fold after all signs of angina may have elsewhere disappeared. The tonsil holds important relations both with deglutition and the mucous tract of the ear. With the former it is observed that towards the close of the second

* Since this muscle, more properly termed the *spheno-salpingo staphylinus*, has been shown by L. Mayer to be part of the same stock with the *tensor tympani*, it must be removed from the pharyngeal group and placed with the muscles of the mucous tract of the ear.

act of deglutition it is drawn well back toward the vertebral column. The infra-tonsillar glands, when engorged, may project against the tongue, and maintain marked irritation, necessitating their excision.

The pressure upward toward the naso-pharynx, however, is often exerted most disastrously. Here, by impairing the tonicity of the muscles about the Eustachian tube, particularly it is thought by exciting irregular action in all the muscles of the otic group, which are supplied by branches of the otic ganglion, deafness is a frequent sequela. When the tonsil grows inward and tends to obliterate the inter-tonsillar space, this danger is averted. It is not, therefore, the fact of engorgement so much as the direction of the extension of the tonsillar mass that may prove mischievous.

After excision, œdema of both sides of the neck has been known to supervene,* which, fortunately, in the instances recorded subsided by the fifth day.

(b) The naso-pharynx can be studied only by the rhinal mirror. The chief influences exerted by diseased action as distinct from those in other portions of the region are due either to the muco-perichondrium characterizing the mucous tissue about the Eustachian tube and at the roof of the pharynx, or to the peculiar tendency of its glandular secretion.

To the first-mentioned cause is to be assigned the obstinacy of all inflammation here, and to the second the extraordinary engorgement of the pharyngeal tonsil, and particularly the growth (elaborately described by Meyer†) pendent from the roof of the pharynx, sometimes to almost entirely occupy the naso-pharyngeal space. We have had several opportunities of confirming Dr. Echeveria's‡ observation, that women with irritable ovaries are liable to a peculiar, obstinate inflammation of the naso-pharynx.

(c) The *soft palate*, as already observed, must follow in many respects the tendencies of the pharynx within which it lies. If the tone of one is impaired, the other suffers. In inflammation both are commonly involved. The depth of the glandular layer on the anterior surface of the soft palate prevents any deep flush attending turgescence, unless the type of disease is severe. The superficial veins, however, upon the palate are often conspicuous, and may be arranged as follows :

(1) A group of radiated venules situated on either side of the raphe of the soft palate, at a point midway between a hypothetical line connecting the prominence of the hamular processes and the base of the

* Dr. Williams, Amer. Jour. of Med. Sci., July, 1853, 225.

† For an English translation of Meyer's original memoirs, see Med.-Chir. Trans., 1870, 191.

‡ N. Y. Med. Journal, 1865.

uvula. Branches from this point running parallel with the raphé may occasionally be united, thus making an H-shaped figure.

(2) A small vein crossing the raphé at a point a little in front of the preceding, and probably corresponding to the limit of the palatal aponeurosis.

(3) Another small vein is often seen at a point answering to the band of fibers belonging to the palatal portion of the palato-glossus muscle, where it joins its fellow across the median line.

When the palate is moderately elevated, the outer border of the elevating surface corresponds almost exactly to the second raphéal vein. The lateral contraction is that induced by the palato-pharyngeals as announced at the point corresponding to the *first* vein. It will follow that, the position of the vein given, the lines of flexion of the soft palate may be determined. It is instructive in studying diseased action of the soft palate that ulcerated patches are occasionally seen at points on the raphé answering with exactness to the above points of flexion.*

The liability of ulceration to appear on the posterior surface of the soft palate is acknowledged. It will be seen that every act of elevation of the palate will bring the ulcer in contact with the posterior pharyngeal wall. This explains the cases of stricture or atresia of the naso-pharyngeal orifice due to syphilitic angina.†

Fibrous tumor of the soft palate is of unfrequent occurrence. Mr. Kelbourne King‡ has described a case observed in a man twenty-eight years of age. The tumor had been growing for three months. It was situated on the left side, and entirely filled the oro-pharyngeal orifice. It projected upward into the naso-pharynx and thence into the nasal chamber. It also grew backward into the oro-pharynx, nearly filling it. The growth was excised, but the patient died on the sixth day of erysipelas.

Hypertrophy of the papillæ on the soft palate has been observed by Andrew Clark.§ Nitric acid was successfully employed in its removal.

Hypertrophy of the glands was described by Nélaton as long ago as 1847.|| It is of slow growth, and requires from five to fourteen years to develop to obstructive size. "The mass may be contained in a separate compartment, circumscribed, distinctly limited, spheroidal, and only very slightly connected with the adjacent parts, so that when its capsule is excised it may be easily enucleated with the finger." The

* Remarks on Soft Palate, etc., nob., Trans. Am. Med. Assoc., 1872, 555.

† For a well-reported case with dissection, see Wm. Turner, Edin. Med. Journ., 1860, lv. 612.

‡ Lancet, 1871, 264.

§ Lond. Hosp. Reports, 1864, 209.

|| See Syd. Retrospect, 1862, 299.

protrusile tumors sometimes described as "flat polypoid growths" are probably examples of glandular hypertrophy.

Carcinoma of the soft palate is always medullary. It may begin something after the same method adopted by lingual cancer, viz., in first infiltrating the sub-epithelial cells. In a case recorded,* the disease appeared as a thickened spot. In another case, narrated by Birkett,† a so-called polypus of the parts, in a man aged thirty-four, was excised, when cancerous infiltration ensued, and death occurred nine months after the first appearance of the polypus.

Prof. Joseph Pancoast‡ has removed a medullary cancer, the size of an egg, from the soft palate. It had been twice operated upon.

Post-pharyngeal Abscess.—Cognate to our theme is the collection of pus behind the pharynx, viz., in the connective tissue between the pharynx and the vertebral column. The pus in this locality pushes the pharynx forward, with consequent impending aphagia and apnoea. Under some conditions the pus gravitates and causes a deep collection of pus to form at the side of the neck, as observed in a typical case by Hilton. Post-pharyngeal abscess is at times caused by strumous caries of the cervical vertebræ. Generally, however, it arises from an intense sub-pharyngeal infiltration, or from inflammation of the mucous surface.

(To be continued.)

EFFECT OF HOT AND COLD FLUIDS ON THE TEETH.

BY ABC. ROBERTSON, D.D.S., M.D., GEORGETOWN, MASS.

A VERY general impression pervades a large portion even of the most intelligent people in the community and of our country that the drinking of hot tea and coffee, and of iced water, by the sudden changes of temperature thus produced, causes the enamel of the teeth to crack, and thus lays the foundation for the decay and loss of a large portion of the teeth thus affected and lost.

This impression, strange as it may seem to those who think for themselves, has been widely inculcated by dentists in our country, and even by some of the most eminent among them. But a more fallacious error or a more egregious blunder was never promulgated in any trusting community.

I had heard a great many times, many years ago, that the drinking of tea and coffee and iced water was the cause of decay of the teeth, and on what was thought to be high authority; but I never believed it, and for the following simple reasons:

* Med. Times and Gazette, 1859

† Tr. Path. Soc. London, 1860, xl. 233.

‡ Med. and Surg. Rep., 1861, 248

It is the natural tendency of all bodies of different temperatures to become, when in contact, of the same temperature. And the closer the contact, the sooner the temperature becomes equalized.

Every root of every tooth is set in a bony socket. This socket is lined by a membrane, called the periosteum, which also surrounds and is attached to the root, to hold it in its socket. This membrane has a full supply of blood, giving it a constant supply of warmth. These sockets and the necks of the teeth are surrounded by the gums, a thick membrane affording them protection from the effects of sudden changes.

The pulps of the teeth, which extend not only through their roots, but far into their crowns, receive a constant supply of blood through the little foramen at the end of each root, which gives warmth and protection.

The very slight degree of vitality in the crowns of the teeth also affords some protection against the effects of sudden changes. The crowns of the teeth are also protected by their close contiguity to the lips, cheeks, and tongue,—so close that but comparatively little change in their temperature can be effected.

When tea or coffee are taken very hot, they must be taken in very small quantities, and passed very quickly through the mouth, else vesication of the tongue is produced. Now, if the little thus taken and so quickly passed through the mouth were thoroughly diffused through the mouth (which, however, it never is, as I will show further on), so little would come in contact with the teeth and it would pass over them so quickly that it would produce no more effect than the rapid passing of a piece of gauze through the flame of an alcohol lamp, which can be done with perfect impunity.

If the fluids taken are comparatively cool, larger quantities can be taken at a time, and may be more generally diffused through the mouth and possibly come in contact with the teeth. But even then the impression would be so slight as to produce no serious effect upon them.

Iced water is usually taken in larger quantity at a time, and frequently makes the whole mouth so cold as to produce a disagreeable sensation, or even pain, in the teeth, especially if they are decayed or have large fillings in them, as the metallic fillings are better conductors of caloric than are bony or fibrous tissues. But still this effect is not sufficient to crack their enamels.

So far, my reasoning on the philosophy of the question. Having for many years been unwilling to take hearsay, or even all that was written and published, for truth, if it conflicted with my judgment, or to rely on my own judgment without the proof of experiments when they could be satisfactorily made, I resorted to the following.

Before giving my experiments, I will digress a little to explain why

fluids taken into the mouth are not diffused all over it, as before hinted in parenthesis.

A very little attention to the physiology of deglutition, which any one can give for himself, will prove it. When a sup of anything is taken into the mouth, it is received by and upon the tongue, which, at the same time, is widened and flattened to its fullest extent. On receiving the article, the end of the tongue is pressed strongly against the inner surfaces of the upper front teeth and their gums, and the side edges of the tongue are in like manner pressed against the teeth and gums along the sides of the mouth. The center of the tongue is depressed, making a sort of tube or waterproof channel between the tongue and the roof of the mouth. Through this channel, whatever is there is forced by the peristaltic action of the tongue into the œsophagus, and thence by similar action into the stomach. So the teeth are protected from contact with all substances during the act of swallowing.

The experiments made, and which proved that no amount of change of temperature can by any possibility be attained in the mouth, were—1, I took a vessel filled with water, which I heated until it boiled, and which I kept boiling until I had concluded my experiments. I then took a tooth which on examination proved to have a perfect enamel. This tooth I held in my closed hand until it had acquired the temperature of my hand, or nearly that of the mouth. I then unclasped my hand directly over and as near as I conveniently could to the boiling water, and dropped the tooth in. I let it remain for a few minutes, and then took it out. First I examined it with my naked eye; then through a double-lensed magnifying-glass of about one and a half inch focus. There were no cracks visible in the enamel. Next, after bringing it to about blood-heat, I threw it into iced water. No cracks. Then I returned it to the boiling water, and from thence immediately into water of the temperature of ordinary well-water, that is to say, of about 60° or 65°. Still no cracks. Finally, I returned the tooth to the boiling water, and from that plunged it into iced water. This cracked it badly. Thus I proved that it requires a sudden change of temperature of about 160° to crack the enamel of a tooth which had been extracted and was deprived of all its vitality and other sustaining supports and adjuncts.

ARTIFICIAL CROWNS.—ADDENDUM.

BY E. W. FOSTER, DENTIST, BOSTON, MASS.

MY method of applying artificial tooth-crowns, which was described in an illustrated article in the July number of the DENTAL COSMOS, lacks one important feature of completeness as practiced by me. A portion of the manuscript of this article was mislaid, and discovered too late to

be of service to the printer in its correction. The part unintentionally omitted is herewith presented, and relates to the use and construction of a crown of gold and porcelain, which may be applied, instead of the entire porcelain crown, especially in cases where extra strength would be required of the anterior crowns, on account of the loss of the posterior teeth—throwing, as such loss always does, the double service of biting and mastication upon the few teeth remaining. Also, in cases of extreme under-bite in a full denture, even such as would endanger the stability of a crown which was entirely of porcelain. This crown offers also the advantage of a gold shoulder for excessive under-bite, and will protect many teeth and roots so situated from the sure destruction that awaits them when subjected to such overdue attrition of their surfaces.

The anterior teeth, at best, on account of their single roots and small diameters, as compared with molar surfaces, are poor substitutes for the latter in mastication, and, without help in this condition of circumstances, their quick and constant depreciation is vitally hazardous to their permanency and beauty.

The strength and durability of these crowns, applied exactly like those of porcelain, is at once apparent. The screw will differ from the other only in being smaller and flat-headed, instead of half-globular. We will simply hint at the construction of such crowns, since any one familiar with gold in the laboratory can make them.

A plate tooth, of suitable size and color, and as thin as possible consistent with strength, and gold-backed, will be first required. An oval piece of gold plate, a little larger than the circumference of the root, and having a hole near its center for the reception of the screw, is next fitted very accurately to the end of the root. A little bit of wire projecting from the root will guide this piece in fitting the parts properly together. After this, a piece of warm wax or gutta-percha is pinched up behind the crown, and, when sufficiently cool, the whole is brought away together by means of the wire, which should project an inch or more. The crown and parts are now imbedded in fire-backing, and the wax and wire finally removed. A narrow piece of gold plate, bent in the shape of the letter U, is next fitted in the posterior angle of the crown and plate, to serve as a receptacle for the screw-head. The parts being neatly soldered together, the crown is removed and finished. Tap the root and set the crown as before described.

Modifications of the above will be suggested in its practice and experience. The whole method, now presented in a practical and concise form, though many lesser details are necessarily omitted, cannot fail, if properly applied in each case, to bring to others, as it has to the writer, the permanent satisfaction of all demands which may be made upon it.

PROCEEDINGS OF DENTAL SOCIETIES.

AMERICAN DENTAL ASSOCIATION.

FIRST DAY.—*Morning Session.*

THE fourteenth annual session of the American Dental Association convened in St. Andrew's Hall, Detroit, Michigan, on Tuesday, Aug. 4th, 1874; the president, Dr. T. L. Buckingham, of Philadelphia, in the chair.

The exercises were opened with prayer by Rev. Mr. Mercer.

After the usual preliminaries of calling the roll and reading the minutes, an amendment to the by-laws, lying over from last year, was taken up and adopted, which makes membership to consist of three classes instead of two as heretofore; the class of honorary membership being added to the two heretofore existing.

An amendment to the Code of Ethics was also adopted unanimously, which qualifies the clause in reference to advertising and cards, so as not to condemn the issuing of cards containing a fee-bill for services.

The special committee on the Barnum Testimonial Fund, being called, requested further time, which was granted.

The Executive Committee reported an order of business, which was adopted, and also reported an invitation to an excursion by boat on Wednesday, which was accepted.

The Committee on Credentials made a partial report, and an adjournment was then had till the afternoon session.

Afternoon Session.

A motion was made to hereafter refuse admittance as delegates to any person who might be in arrears for dues; which gave rise to discussion, but which was finally carried.

Reports of Committees were then declared in order; and that on Dental Physiology being called, Dr. Dean, chairman, submitted a report, of which we give a synopsis.

The report referred to a certain article by Prof. McQuillen, published in the DENTAL COSMOS in 1860,* in relation to the phenomena attending the absorption of the deciduous teeth. (This paper was read by Prof. McQuillen at the request of the association, and we give here, for the sake of convenience, a brief synopsis of its contents, although it was read immediately following the report of Dr. Dean.)

Dr. McQuillen's paper first reviewed the various theories which had been propounded from the earliest times down to that date, and pronounced them vague and unsatisfactory. It then directed attention to

* Absorption of the Roots of the Deciduous Teeth, by J. H. McQuillen, M.D., D.D.S. Dental Cosmos, vol. i. p. 579. 1860.

the fact that the teeth must not be viewed as isolated organs, but as integral portions of the entire economy, and subject to the same influences that control the function of nutrition in other portions of the organism; that from the first both composition and decomposition of all the tissues is constantly taking place,—varying as to rapidity in the different tissues and at different ages. Various proofs of this, as regards the bones, were referred to. As in the development and formation of the various tissues the primary active agents are cells previously existing in a structure less fluid, called blastema, so in nutrition the end is attained by or with the continued energy of cells. Each cell is an independent organ, having a definite period of existence, and in them every organ has in itself the elements of construction and destruction. Therefore the agency of an acrid substance, or of a carneous body, which had been supposed to be necessary to the absorption of the roots, is not demanded; retrograde metamorphosis or molecular disintegration fully accounting for it. The dental tissues are but a congeries of cells, constituting an animal matrix, in which the calcareous salts are deposited. As the animal matrix degenerates, cell by cell the calcareous contents are liberated, and become mixed with the fluids, to be taken up by the venous or lymphatic radicals. In a normal state waste and repair are balanced; when they are not, either hypertrophy or atrophy results. The absorption of the roots of the temporary teeth is but an instance of atrophy of the dental tissues. For a brief season repair is equal to waste, and no change takes place; but eventually disintegration supervenes, and the roots are absorbed and the tooth falls out. It is reasonable to infer that the action is connected with the development of the permanent, for no instances are on record where it has occurred without the deciduous tooth being followed by its successor. The germ of the permanent tooth occupies a position in close proximity to the roots of the deciduous tooth, where it remains for some time in a state of dormant vitality, or at least with no increase of size; but eventually a new life springs up in the permanent germ, it draws from the blood the materials inservient to its development and growth, and in so doing removes from the current flowing to it and to the deciduous tooth, through arterial twigs from the same vessel, the constituents necessary to repair the waste that takes place in the latter. In many instances the supply is equal to the demand of the permanent and deciduous organs, and under such circumstances the development and eruption of the former takes place, with little or no absorption of the latter. In addition, as the permanent papillæ increase in size, and the crown of the tooth is formed, the vascular structure surrounding it makes a graduated pressure, first on the capillary vessels of the osseous partition, and then on those of the deciduous tooth, thereby arresting or diminishing the flow of blood distributed to those tissues. By these

two causes not only the *quality* but the *quantity* of blood sent to the deciduous tooth is modified, and absorption is favored. Of the effects of a graduated and continuous pressure in producing absorption of bone, the atrophied condition of the body of a vertebra that has been subjected to the pressure of an aneurism may be cited. In such case the pressure upon the capillaries of the periosteum does not cut off the blood entirely (which, if occurring, would induce *necrosis*), but merely diminishes the current, so that the supply is not equal to the waste, and atrophy is the result. The influence of the sympathetic nerve must not be lost sight of, as nutrition is more or less dependent on this connection.

Dr. Dean's report proceeded to examine the foregoing author's more immediate cause of absorption, viz., atrophy; stating that it involved objections which to his mind were irreconcilable with established facts; it was stated that if supply and waste in the dentine are constantly going on, the channel by which it was carried on was the apical foramen; if absorption results from a privation of nutritive material, it must be in *all* the tissues nourished by the source of supply, and commence in the interior, and would take place uniformly throughout the dentine; which is not the case. Absorption commences and continues externally, and the interior retains its integrity for a long time. If we admit that pressure may cause atrophy, it cannot be claimed that the portion of dentine pressed upon has been deprived of nutriment. We sometimes find absorption or atrophy in the roots of the teeth of aged persons, which it cannot be maintained is due to want of nutrition, since the interior cavity has at the same time been obliterated, showing an excess of nutrient supply. It is rather due to an abnormal action of the root-membrane, differing entirely from the process of removal of the temporary teeth.

If this absorption is the result of deficiency of nutrition, why are not pulpless milk-teeth removed more rapidly than others? The supply is entirely cut off, and the waste should increase in proportion. The facts are quite the contrary, and are antagonistic to the theory of atrophy.

It is apparently considered, by the author spoken of, that the cells of dentine retain their individuality; it is so held by others. But to me it seems that dentine is not made *up of* cells, but *out of* cells. Tomes, Beale, Waldeyer, and others support this view. The cells have been metamorphosed, and the dentine is the product. The author again says that the cells have a definite period of existence. It seems to me that that period is dependent on circumstances and conditions which are variable. Matured dentine is not disintegrated unless surrounded by morbid tissues, or from mechanical means,—even if its nutrient supply is entirely cut off. Teeth pulpless for twenty-five years are matters of common observation.

Some claim that the dentine of pulpless teeth is sensitive, or at least vital. If so, whence is its nutrient supply? Can it be from any other source than the same cells from which it was derived—ostoklasts converted into germinal matter? If we say no, where are these agencies in the pulpless tooth? Dr. McQuillen himself says that the particles newly added must impart their own vital properties, and the principle I have just stated was derived from Beale, who says that all formed material passes through the condition of germinal matter.

The report then called attention to facts in connection with the accepted theories in regard to the immediate agents causing absorption. Physiologists agree that these teeth are removed directly by the agency of an absorbent papilla, though a difference exists as to the origin of this body and its mode of action. Tomes describes it as applied closely to the wasting surface of the tooth, the indentations of the latter being occupied by the large cells of the body. Kehrler believes that the amoeboid cells mine away the tooth by long finger-like processes. Kölliker attributes it to "giant cells," which occupy the lacunæ or pits observed in absorption, and which are organs which destroy the dentine. These are the recent expressions of Kölliker.

The subject being open for discussion,

Dr. Atkinson congratulated Dr. McQuillen on his efforts to correlate the best authorities then known, but then or now, it will not do for us to talk of function and stop at cells. Molecular metamorphosis is an unfortunate term, because it is not only molecular metamorphosis, but it is granular metamorphosis, and that is what breaks down cells. Molecular metamorphosis changes the fluid protoplasmic mass under the law of the activity of special combinations of affinity. Until we get right upon our knees and investigate the very territories of the activities we are speaking about, we shall never do more than pronounce mouthfuls of incongruous apprehensions. What is absorption? Simply bringing back to a fluid again what was fluid before; and it might as well be done by a carneous body as anything else if we were beginning *de novo*, but we are not; we are under law, and investigating operations in bodies capable of being seen and misinterpreted. It is no reason why because we cannot go to the very origin of modes of motion down to final causation, we should not go any of the way. What do we mean by metamorphosis and the germ of cell-life? We shall never know till we go back to atoms, and understand how they become satisfied in bonds of affinity, forming molecules, and molecules granules, and granules cells, and cells tissues, and tissues organs, and organs systems. We must go back and know how cells generate. There are thirteen kinds of atoms in the body, and because of their changes of relation they present us with molecules, and it is because of their endowment of power that we get any functional activity. When oxygen and hy-

drogen are brought together in that relation by which their affinities can express themselves they become water, and the smallest speck of water is a molecule and not an atom. We cannot see an atom or a molecule as such. When they grow to granules we begin to differentiate them. The law of the bonds of affinity being satisfied, we get healthy protoplasm. If we have sickly granules we cannot get healthy cells, or healthy tissues or organs. Solution is before absorption always; why not say solution? We do not understand why some teeth should develop to a certain extent and then stop, while others develop completely, still leaving the roots of the temporary teeth complete. We have been dealing with the machinery and implements of function. Who can say when there are enough cells deposited to complete tissue? Only the master-builder,—the little typical presence that says that four fingers and a thumb are enough. We must resolve ourselves into both physicists and spiritists before we can get at the truth. When we understand dynamic atoms we can go on and talk of function. We have the positive neural blood set off against the negative vascular blood. If we near what causation is, we shall understand what kind of food ministers to each kind of molecule. I would advise any student of microscopy never to read Schwann and others, for they will be stumbling-blocks in the way. Read the book of nature for yourselves.

Dr. Knapp. The writer of the report (Dr. Dean) omitted to mention the fact put forth by Tomes, and verified by observation, that there is no absorption in the root of a deciduous tooth after the death of the pulp. It is no proof, because we find such teeth partially absorbed, that the absorption did not take place before devitalization.

Dr. Judd. Absorption as now used means not only sucking up but a breaking-down process of the hard tissues. Atrophy and absorption are entirely different processes. Atrophy is a molecular disintegration not recuperated by progressive metamorphosis. The process of nutrition is arrested, while the retrogressive process still goes on. In absorption we have as it were a cutting away of the whole root, not a shrinking down of the root, as in soft tissues that are atrophied. Dr. McQuillen asks whether there is any carneous body found in absorption of ordinary bony tissues. If I understand Kölliker, he claimed that in all cases of true absorption these ostoklasts are found veritable carneous bodies. It is not, however, a mass of cells, as in the absorption of the deciduous teeth. If this be true it is a considerable advance upon our previous theories, though it does not explain everything. The origin of these "giant cells" we have not been able to determine. We often find that when we tear away the veil that covers up one thing, we reveal still further mysteries.

Dr. Atkinson. We must observe whether the ostoklasts are before or after absorption. Results are taken for causes nine times out of

ten. We should not commit ourselves by saying that these are forerunners of the breaking down.

Dr. McQuillen. Dr. Atkinson's exceptions are well taken when he asks, with regard to the osteoklasts, odontoklasts, giant cells, amœboid cells with finger-like processes, etc., said to tear away bone and tooth structure, Do they precede or follow absorption? It is reasonable to infer that the latter is the case, and that they are only the osteoblasts and odontoblasts freed of their calcareous constituents. It is one thing to theorize, and another to examine the operations of nature; and although nutrition is not an object of microscopical observation, for in the effort to observe the process is stopped, yet much can be learned by examining the arrangement of the cells in ossifying cartilage and in the pulp of the tooth of the calf; preparations of which will be shown, under the microscope, to any of the members present who desire to see them. The osteoblasts of bone and the odontoblasts of dentine are but modified cells. The odontoblasts are elongated cells, arranged side by side at the periphery of the pulp, and constituting the "membrana eboris." Kölliker's theory is, that the odontoblasts secrete a gelatinous substance that eventually becomes by calcification the intertubular structure, while the odontoblasts are converted into the sheaths of Newman and the fibrils of Tomes. According to Beale the outer portions of the odontoblasts assume a gelatinous structure, which undergoes calcification, while the central part remains soft (the fibrils of Tomes), and the intermediate portion constitutes the walls of the dentinal tubuli or sheaths of Newman.

Dr. Judd. The meaning of "cell" is much changed from what it was twenty years ago. It is a nucleus surrounded by protoplasm; the primitive element from which tissues are formed. There is no necessity for walls, it is a living being without walls.

Subject passed. Adjourned.

Evening Session.

Minutes read and approved.

The same subject under discussion.

Dr. Atkinson said that he regarded the carneous body as a result and not a cause of absorption; it is a first-class scar tissue. The pulp can die and leave the carneous body alive. Any body that becomes foreign must either be thrown out or encysted; it cannot remain to go into decomposition. Death of the pulp produces decomposition. We call a pulp the nerve, but we might as well call the gum nerve. The circulation is the same, the nerve is the same, and there is also connective tissue.

Prof. Judd. Some facts must not be lost sight of. It is there ~~about~~ about there being a less amount of circulation. Suppose we

circulation and take out the pulp, do we have absorption going on? Never. Then it is no want of nutritious material, no atrophy.

Dr. Atkinson. There is a sereoid aneurism under the cap of dentine,—proud flesh in other words. It is not the approaching tooth; never knew such a case.

Dr. Judd inquires how Dr. Atkinson accounts for the carneous body. Why are the cells larger, so that they are called giant cells? Facts ought to harmonize.

Dr. Atkinson. Small soap-bubbles break into larger ones; the distinction is perfectly clear.

Dr. Dean. The absorption of ivory pegs in living bone proceeds the same as in the bone; it is, therefore, no loss of nutrition.

Dr. Taft. Is the carneous body the pulp of the temporary tooth in a changed condition?

Dr. Atkinson. They are similar, but not the same. This body never exists after the death of the pulp.

Dr. Taft. There is a difficulty; the root is often removed when the pulp is not invaded. His impression is that the removal is effected by the carneous body; what that body is matters not, the root is dissolved and removed like other débris. To be taken up, it must be a solution, and the solvent can come from nowhere but from this body; there is no privation of nutrition. The character and function of the dentine remain.

Dr. Atkinson. This is simply assertion. How does a ripe pear drop? We cannot understand it, but can appreciate it, as we do that ten times ten is one hundred. No one can understand for another.

Dr. Knapp. An important tissue has received no attention,—the periosteum. This membrane undergoes a change; on the approach of the permanent tooth it becomes thickened. This had to do with the building-up, and why not with the tearing-down?

Dr. Palmer. When silver is placed in the battery by the platen, there is no absorption till the current passes, and then the material is placed upon the other pole. The life is the chemical affinity; it has power to know how much to take away.

Dr. McQuillen. It is a well-recognized fact that the process of absorption is arrested with the death of the pulp of a deciduous tooth. He could not comprehend the distinction that had been made here between atrophy and absorption, believing, as he did, that in nutrition as in other operations "nature acts not by partial but by general laws." Great stress has been laid upon the part that the giant cells perform in breaking down osseous and dental structures, but it was difficult to understand how one tissue could tear down another.

The subject was then passed.

The report of the Committee on Pathology and Surgery was next

called for, and Dr. Cushing read a report written by Prof. Chase, of St. Louis.

Dr. Chase's paper was entitled, "Some Observations on Diseases of the Enamel." It stated that the enamel was subject at an early period to inflammation; and, even later, to some of the movements which resulted in inflammation and death. The permanent teeth, during their development, are injuriously affected by various skin-diseases,—small-pox, measles, scarlet fever, etc.,—which leave a certain impress upon their structure. The enamel sheath partakes in the inflammation, and every prism is affected. Cell-life is now most active, and building is going on; but if the workmen are sick, or if there are no materials, progress is arrested. Absorption, however, goes on, and the result is pits or grooves, which show after eruption. White, chalk-like spots are caused by inflammation of a small number of enamel cells before crystallization, resulting in stasis of the lime salts. Seedy or granular enamel is caused by inflammation at a later period. There is, in healthy enamel, a free circulation of blood plasma, through osmotic action. As age increases, the activity of nutrition diminishes. The dental tissues are in a state of mobility up to, and, the writer believes, long after, the fifteenth year. The enamel has not then that vitreous appearance which it has later. The interior parts of it are not as hard as the outer, since it begins to harden at the exterior, which is always in the advance. It is demonstrated that absorption takes place in the dentine, and, in rare cases, in the enamel. As we have seen, inflammation before eruption causes necrosis of the enamel; and the same result may be produced after eruption, by pressure of an adjoining tooth, causing arrest of circulation and stasis in the enamel; the tooth at fifteen years presents a whitish spot without polish, and cutting like rock-salt. At twenty the spot is brown, and vitreous on the surface, but soft underneath, and the dentine is softer than natural. At twenty-eight the spot is black, but hard and vitreous, shading off in color and density until the dentine is reached. This is not caries, but a case of arrested circulation. Spontaneous abrasion can only be explained by a theory of vital action like this; and the literature of the subject shows cases on record confirming its truth, and even of united fracture of the enamel.

The subject being open for discussion,

Dr. Atkinson said that the paper was full of statements which were purely gratuitous, though they may be truths; the heavenly court may have illuminated the writer. If he asserts that enamel calcifies towards the interior, he is at fault; for it calcifies at the periphery. The report said the enamel was a dermal production, and he is sorry for him and for the world that they don't get along any better than that. Enamel is hypodermal,—dentine is dermal. Objects to the statement that it can be inflamed; it is a good stretch to suppose that dentine

the change which takes place in enamel is increase in density. Many immorally attribute effects to the hydra-headed monster syphilis which may be produced by scarlet fever and other diseases.

Prof. Judd. It is incorrect to suppose that inflammation takes place in the enamel, and it is probable that the paper has been misunderstood in reference to the manner in which enamel calcifies; objects to statements being made dogmatically because the writer thinks so; claiming circulation in the enamel is going further than most physicians would go. Circulation is not the proper word. The enamel may be permeated as marble is by water; setting teeth on edge is an effect of this. There is some kind of nutritious change, but it is small and slow; but no vital changes sufficient to bring about true inflammation. Would not say that nerve fibrillæ did not permeate the enamel. It was for a long time supposed that they did not permeate the muscular sheath; but it is now known that they do, also the epidermis. These fibers extend farther than we suppose. The sensitiveness of enamel to acids may be accounted for in this way. There is a great difference between caries and abrasion; it is probable (but not stated for fact) that the shaping and direction of carious cavities are due to the action of parasites; in abrasion the tubes are filled up, and no opportunity is afforded for them to gain a foothold. No experiments have produced caries without parasites. They cannot be accounted for by acids.

Dr. Bogue. If the pulp were really nerve, as it is called, there could be no such pain as *tic-douloureux*, since this is from engorgement of the circulatory vessels. The first stage of toothache is irritation, and its result sensitiveness; it is caused by decay, while abrasion is caused by the recession of the alveoli. The second stage is inflammation,—pulp nearly or quite exposed. Pressure, etc., produces acute pain, until strangulation takes place. The first stage may be relieved by filling; and in the second, if we could prick the pulp and draw a drop or two of blood, it would give relief. Self-cure is death of the pulp; putrefactive disintegration and injection of gases through the foramen follow. This is the proper condition to produce abscess. When devitalized teeth are opened and the sporadic germs in the air come in contact with the pulp, abscess is apt to be formed.

Dr. Hunter inquired whether, in perfectly-formed enamel, acids can permeate and set the teeth on edge.

Dr. Judd thought certain fluids might permeate from the outside even when perfect.

Dr. Atkinson. It is always permeated. Specimens crack when dried. Protoplasm is neural mass, or granular matter, or what you please, and removal of some of its elements sets it on edge; a soapy or alkaline wash cures it instantly. Doubts whether any microscopic spore can enter even the tubules. Chemical action must be endowed

with a mode of power which we denominate vital. When we say crystallography is want of life, we have proven our non-survey of the whole field. Wherever action is, vitality must be.

Dr. Butler. We can demonstrate that the enamel is permeated from without. When the dam has been applied it becomes whitened, and when wet returns to its former condition.

Dr. Morgan. It will be questioned that the enamel is a vital structure; if so, it must be subject to the same laws that govern other parts of the body; animal matter may be removed and restored. There is no sensibility, so far as he knows, in enamel; when teeth are "on edge," the enamel is not perfect. In some specimens the tubuli penetrate into and perhaps through the enamel. In these cases you may have sensibility.

Dr. Walker. Nutrition takes place by means of fluids, and no other means. Experiments have proved to him that vast changes can be made by attention to nutrition. It will be an important subject in the future. The process is simple. When the teeth have been softened, they can be restored by the proper elements of diet, lime-water, etc.

Adjourned.

(To be continued.)

AMERICAN DENTAL CONVENTION.

FIRST DAY.—*Morning Session.*

THE twentieth annual meeting of the American Dental Convention was held at Saratoga Springs, August 11th, 1874, and was called to order by the president, Dr. John Allen, of New York, at ten o'clock A.M. After the call to order, prayer was offered by Rev. Mr. Woods.

Dr. J. G. Ambler then read the programme arranged for the meetings, and a tender of rooms by the village authorities.

Dr. Ambler then stated that it had been expected that Dr. T. W. Evans, of Paris, France, would have delivered the opening address as announced; but he was not present, and that address was, therefore, necessarily dispensed with. It seemed, however, that there was after all no lack of addresses.

First, Dr. J. G. Ambler, after a few remarks in prose, delivered an address of welcome and congratulation in the poetic vein.

Rev. L. S. Rowland then delivered an address of welcome. He thought Americans might well be proud of the position that "American Dentistry" occupied abroad. He recognized dentists as those who were endeavoring to raise humanity to a higher standard, and never knew one who was not a gentleman, a good citizen, and an honorable man.

L. E. Whiting, M.D., not being able to be present in person, sent a letter of welcome on behalf of the Saratoga Medical Society, &c.

was read by Dr. Ambler. Dr. Whiting recognized the dental profession as assistants in the cure of disease, and as the most enterprising and practical profession in existence. A few years ago it was a mere appendage to medical practice. The medical profession is proud of its present high position. To a dentist we are indebted for the discovery of anæsthesia.

Dr. C. A. Elmore then delivered an address of welcome on behalf of the Fourth District Dental Society. After welcoming the members to Saratoga in a few well-chosen remarks, he referred to one of the fathers of dental history, Amos Wescott, to whose memory he paid a merited tribute.

President Allen then delivered the annual address. He took a retrospective view of the profession for forty years, and found it gradually advancing. Then there were no conventions, colleges, libraries, or associations; now there are national organizations, besides a hundred local societies, ten dental colleges, and six or eight dental journals. Then the means and appliances at the hand of the dentist were limited; gold and porcelain teeth were not furnished in such perfection as now; instruments and devices for operating now afford far greater facilities,—but perfection has not been attained, the summit has not been reached. We must go forward or we will fall back. When trees cease to grow they begin to decay; so with our profession; and even now one of its branches needs pruning. We should each do something to leave its imprint, either by excelling in what has been done or by taking some advanced step. Devotion to our profession is the secret of success. Michael Angelo said that painting was his wife and his works were his children.

The subject of dental education was then alluded to. It was stated that there were two kinds of education,—that from others, and that which each gives himself. The self-education is that to which we look for advance. Art may be learned, but cannot be taught. This is exemplified in the failure of graduates to perform what might be expected of them. The self-culture is that which will place us in advance of others. It taught Morse to solve the problem of the transmission of thought with lightning speed. Let us exercise and cultivate our reasoning and perceptive faculties for the advancement of our profession.

Dr. Taft being called upon, adverted to the early days of this body, when it had greater vigor than it could now be said to possess. Our standing in society, and as to other professions, is owing to efforts like this. How much of it is owing to this very body? How much stimulation has gone from this to other bodies? The fact that societies had multiplied would account for the fewness in numbers present. We should take pride in making these efforts all they ought to be,—should

assist each other, stimulate each other to a better onward course and to more faithful work. We have other duties besides attending merely to manipulation. We owe much to each other and to society, which is daily making higher demands upon us, and perhaps will soon demand immunity from dental disease, which some even now do. Shall we fail to answer this demand? No; let us come up to the highest level, and endeavor to redeem humanity from the diseases that carry us away to death.

Dr. Covell, of New York, in response to a call, made a few remarks. He believed in liberalism, in communicating our knowledge, or confessing our ignorance. He believed he was the first to originate the raised center in the impression-cup, but did not feel called upon to keep it private, and it had been a benefit both to him and others.

Dr. Ambler alluded to the old American Society of Dental Surgeons, which was organized in 1847. He characterized it as restrictive, arbitrary, and humiliating. Those who had become disgusted with it organized another society, on the ruins of which this one had arisen. He himself owed his conception of what dentistry might become to this body. An organization additional is by no means oppositional. We should bury all feelings of rivalry.

Adjourned.

Afternoon Session.

The subject of filling root-canals was opened by a paper by Dr. Brown, of Poughkeepsie. This paper, after adverting to the various methods and materials used for root-fillings, and setting forth the objections to most of them, detailed at some length the method adopted by the writer, which, in brief, was the use of cotton charged with oxychloride of zinc. This was, in the opinion of the writer, the best material that could be used, for several reasons.

A discussion then took place, opened by Dr. Gillespie, who stated that he indorsed the practice advocated by the essayist. He spoke from experience. There was danger of passing gold through the foramen when that material was used. He had extracted many teeth with wire and gold protruding. Had used cotton saturated with creasote, which is superior to carbolic acid, but preferred oxychloride instead.

Dr. Covell. The trouble is to tell when you have reached the apex. Anything passed through will irritate. Sees no advantage in using cotton over oxychloride alone, but has had no experience in its use.

Dr. Gillespie uses a smooth watch-maker's broach, annealed, and with the point cut off, so as not to reach the apex or remove all the nerve; prefers to leave one-eighth or one-sixteenth of an inch, which is well saturated with creasote and converted into carbolate of albumen; this is better than incurring the risk of passing through the foramen.

Dr. Covell. There are two kinds of roots,—those recently devitalized, and those which are dead previously, or in which suppuration has occurred. When this is the case, is there danger in the method proposed?

Prof. Taft. In many teeth there is no danger of passing through. A well-formed tooth has a constriction at the apex after maturity. Ordinarily there is no danger of going through. He had seen teeth bored out at the side of the root. Judgment is necessary, and it will lead to correct conclusions. There is danger in incomplete teeth, and there is a great difference as to the amount of development at the same age. He had seen teeth at seventeen years of age with large openings at the apex of second molars. Earlier, they are frequently large. Great care must be exercised. We should not force anything through, but should fill all the space. The structure of teeth varies much; in the soft teeth there is greater liability to trouble. Has not found, and does not expect to find, a method that never fails. Sometimes it is better to leave the root open than to fill. When there is a great proportion of soft solids the tendency is to disintegration. Discoloration depends either on decomposition of the soft solids or permeation of the tubules by the debris of the pulp. Even when the pulp is properly removed, the decomposition of the soft solids will force gases through the foramen. We should employ treatment and material that will prevent this trouble. Whatever is put into the canal must not be decomposed, and should be saturated well with carbolic acid. Sometimes it is better not to fill, that the gases may escape into the canal. Bleaching is impossible if the dentine is permeated. We hear that various materials are successful. Probably we each succeed best with our own method, because it is our baby. Don't think changes of temperature make much difference. If they do not produce difficulty with the pulps, they would hardly do so in roots. Has left the root open and left a fine opening through the filling. It is well sometimes to close the apex with cotton, and leave room for the emanations. If the tooth is sealed up, what harm can come from leaving the pulp-chamber open? He does not, however, advocate this practice, but if difficulty was apprehended, would leave open until tested.

Dr. Covell had never succeeded with any one method. When roots are fluted, had never been able to fill and retain in the mouth. Thinks the method of the paper good in some cases, especially in dead teeth; uses gold, however, when he can get it,—No. 2, if possible,—and hammers it in. Dr. Moore uses block-tin; fits as well as possible, and reports almost uniform success. Would cut away to get a free opening. We are too apt to confine ourselves to one material. We often have occasion to use different materials for the same purpose on the same day.

Dr. Gage said that his own teeth had been filled years ago with floss-silk, and were still in good condition.

Dr. Taft. All cases are not alike; each one has its individuality.

Prof. Coy said that sponge could be packed hard, and has been known to last twelve years. He contended for conservative practice, and that different materials were indicated in different temperaments and in different positions; disapproved of hobbies or dogmatical teaching.

Dr. Ambler. Is not satisfied with oxychloride mixed with cotton; theory is against its success. The only argument in its favor is its facility. Why should we use a destructible material? If there is greater facility, there is not more efficiency. Cotton might not produce injury, but it is uncertain, and unless there is more argument in its favor he would not use it.

Dr. Brockway. Is cotton mixed with oxychloride destructible? He carries a pellet of cotton saturated with creasote to the apex. Had removed teeth for other reasons and found the cotton seemingly unchanged.

Dr. Gillespie. Carbolic acid preserves wood and other fiber; blocks in the Nicholson pavement, as well as piles, are preserved for a great length of time; it will preserve cotton also. Had seen teeth so treated, when opened years after, still pervaded by the aroma of carbolic acid. Had one himself which lasted fifteen years, and the cotton was not destroyed. There are few cases that he would leave open, but would fill doubtful ones not so tightly with fibrous material, and leave a small opening out of the canal. The carbolic acid will also penetrate the tubuli, and convert their contents into carbolate of albumen and prevent decomposition. This is an insoluble compound, and both the tubuli and foramen would become plugged with it.

Prof. Taft. Oxygen is the agent of decomposition, and if it is excluded the material is preserved. Carbolic acid does this by pre-occupying the place.

Prof. Coy. Oil prevents absorption of noxious materials in dissecting; the pores are already full. When tar is freely used the tendency is to purify, and the progress of southern epidemics had been checked by it. It is a disinfectant and destroyer of noxious material.

Prof. Taft. Disinfectants are of two kinds: one destroys the compound and takes away its elements; the other merely prevents decomposition; of this class is carbolic acid.

Dr. Gillespie. Carbolic acid prevents wounds from becoming offensive. It is also anæsthetic. Thinks carbolic acid forms a new compound with cotton or silk fiber.

Adjourned.

(To be continued.)

SOUTHERN DENTAL ASSOCIATION.

(Continued from page 491.)

SECOND DAY.—*Morning Session.*

THE meeting was called to order at ten o'clock.

The subject of "Irregularities" was still under discussion.

Dr. Morrison exhibited models, showing what he had thought was satisfactory rapidity in moving teeth, but he had been interested to hear of the much greater rapidity with which certain cases may be regulated.

Dr. Eames said that it had been stated that Dr. Stellwagen had been the only one in this country who had practiced torsion; but Dr. Hitchcock had practiced it, using lead or chamois to protect the tooth, turning it a little at a time, and also a little beyond where it was wanted, and reported success.

Dr. Forbes. Our object in these efforts is to enhance personal appearance. The shape of the features must be taken into the account. If the nose and chin are small, extract, and do not try to expand the arch. He had extracted four sound bicuspid teeth to preserve the teeth and add to the appearance. In another case he had wrongly advised not to extract, and the patient was deformed. The features are often not considered.

Dr. Chase. It takes moral courage to recommend extraction in these days. It is, however, too much the fashion to save every tooth. It would, as a rule, be better for all persons to have at thirteen years of age four bicuspid teeth extracted, without regard to decay. The teeth would be better at twenty-five.

Dr. Knapp. It would be carrying it too far to say we are justified in extracting four teeth in every mouth.

The subject was then passed.

The subject of "Operative Dentistry" was taken up.

Dr. Arthur, the president, took the floor, and said that it was known that he was an innovator in the treatment of teeth; and his views have been criticised, but he had never publicly met his opponents. His object was truth. He had investigated thoughtfully, and was satisfied that he had arrived at correct conclusions, and was ready to defend his views now and ever. He has, however, been misunderstood; he never advocated the indiscriminate filing of teeth, and defied any one to point out where he had said anything of the kind. It is admitted by all that his method in some particulars was unobjectionable. He merely opened the subject, leaving it for others to proceed with the discussion.

Dr. Chase. Loves truth, and is not afraid to tell it; to tell the real thoughts is the only way to grow. Is in favor of extracting sound teeth to give room, instead of cutting away. Has seen a great deal of favorable results of cutting away when the teeth were properly

cleansed and did not come together, but larger numbers were deformed by it than by extracting. If the first molar was decayed on the anterior surface and had crevices in the crown, we should consider what would be likely to be its condition at twenty-five; and if it will not be good, he would keep it till eleven or twelve and then extract; the second molar and bicuspid would fill the space. Teeth decay from pressure, necrosis of the enamel, and non-circulation of the blood in the enamel. He contends that enamel has a circulation of the plasma of the blood. Often we find enamel dead, but hard and chalky underneath, and the dentine decays. We want each tooth by itself; we must give room by extracting a first molar or bicuspid. Enamel consists of cells with a basal structure; each prism is covered with a membrane through which circulation takes place. There is, of course, no red blood, but there are large territories in the body which are not supplied with this, but are nourished by endosmotic action.

Dr. Arthur said the physiological views of the last speaker may or may not be correct, but they have no bearing on the subject. He objects to the removal of the first molars, and remembers a criticism that appeared in the *Missouri Journal*, upon the chapter in his book in relation to their extraction, to the effect that if the writer had attended the meetings of dental societies he would not have found it necessary to spend so much effort to refute a practice which nobody defended; he was, therefore, surprised to hear a St. Louis dentist advocate extraction to such an extent. There were repeated instances of contact and decay of the remaining teeth when the extraction of the first molars has been practiced. It may become necessary to extract every alternate tooth if we rely upon this means to prevent contact. There are many points in his treatment to which no objection can be urged. Decay of the first molars commences as soon as they appear. In many cases the pulps become exposed at a very early age, and the loss of the tooth becomes inevitable. If taken out too soon, injurious results follow, and irregularity is caused. It is necessary to preserve till ten or eleven. Cutting away the distal surface of the temporary molars can certainly do no injury, and is not bad practice; it is the simplest mode of treatment possible. He does not advise the indiscriminate filing of teeth of every child. We must ascertain the first touch of decay in the incisors. In general, however, these teeth are not examined until too late. Superficial caries can be arrested by filing. Who, then, can be so mad as to cut cavities not already formed and fill them? Plugging front teeth is never necessary, except as a consequence of a dereliction of duty on the part of the parent or dentist; but if the first operation were to fail you have one more chance, and at last you can resort to filling. He cannot see how any objection can be raised on the ground of disfiguration, in the face of statements he had made. There is no disfiguration.

Dr. Morgan said he was only seeking after truth ; he only regarded the good of the profession. He had a high regard for Dr. Arthur, and did not intend to be personal in what he might say. But this practice of Dr. Arthur's is wrong, and as an observer he is unreliable. He has been hunting up proofs, and has forgotten or overlooked those on the other side. The enamel has vitality, though Dr. Arthur says it has not. He objects to the assertion that pain is entirely avoided (or nearly so) by this practice. Who indorses that? Who can accept the statements of a man who makes an assertion like that? He says no objections have been heard ; they are nearly universal. He says the enamel is smooth and polished ; but it is often in grooves and pits, as we all know. According to his own showing it is exposed to attack. Will you rely upon the observations of a man who makes such fatal mistakes? He thinks not. The assertion that such constant care is necessary, is refuted by the fact that there are sound sets that never had a tooth-brush upon them. His father had never owned a tooth-brush, and a dentist scarcely ever looked in his mouth, and at the age of seventy-nine he had not a defective tooth. The foot-note on page 23 of the book, which states that it is not strictly accurate, is well put in. When a man makes statements by authority, and sets himself up for a teacher, he should be correct. He objects to the book because of that note. Tomes does not claim that he demonstrated the presence of nerve fibrillæ in the dentine, though the book says that he does. "The enamel," he says, "is devoid of vitality, and has no power of resistance ;" and on the next page he says it has more than dentine,—a plain contradiction. On page 39 he does the profession great injustice, when he says that "plugging" is the only means generally recognized for arresting decay.

He says that filling is the only means relied on to arrest decay. Who recognizes that? Nobody in this house except the gentleman himself. The book is full of contradictions. On page 103 he says a dentist should be able to tell when teeth are to decay. He is not able to determine. Sometimes it seems certain that decay will take place, but change of circumstances or health may avert it, and we find ourselves mistaken. He finds fault with the book because the plates represent only one class of teeth : those accompanying a thin face, which have long crowns and necks, are not represented in any of the plates ; this is unfair and unjust. He does not take the ground that teeth cannot be preserved by the removal of the incipient decay ; he was taught this, and it can be done ; but we run risk in attempting it, and filling will often preserve when filing will not do it.

Dr. Arthur said he did not regard any remarks directed to his views as personal ; he had courted discussion on the subject. As to his riding a hobby, what man who becomes sincerely convinced of any truth will

not endeavor to press it at all times and on all occasions? He does not regard the attack just made as formidable; the gentleman takes up minor points having no bearing on the principal subject, and finally admits the correctness of his practice.

[The hour of adjournment having nearly arrived, Dr. A. reserved any further reply to Dr. M. until the afternoon session.]

Dr. Walker has not made microscopical and chemical investigations, but he thinks he can understand the fact that the sun shines as well as those who can analyze its beams. Is thoroughly convinced that there is a circulation in teeth and a deposition of material.

Adjourned.

Afternoon Session.

At the opening of the afternoon session Dr. Arthur called attention to, and exhibited with the aid of a battery, the working of the electric engine and the electric mallet. Dr. Arthur stated that he had employed these instruments in his practice for several years, and regarded them as the greatest improvements yet made in the appliances of operative dentistry. The mallet he exhibited he stated to be a very beautiful improvement by Dr. Jack, of Philadelphia, upon the original invention of Dr. W. G. A. Bonwill, of the same city.

The condensation of gold foil in the operation of filling teeth requires no inconsiderable amount of force. In old times, when muscular force was relied upon, the strongest man was the best operator; but late improvements have made a great change in this respect. The mallet, although not a new appliance, has lately come into very general use for the purpose. The automatic mallet was an advance upon the hand implement. The electric mallet is so far an improvement on anything yet done in this direction, that he had been amazed that so few intelligent practitioners have availed themselves of its great advantages. As much might be said of the value of the electric engine, which Dr. A. has had in constant use for more than a year, and which he stated he would not dispense with for many times its cost. It has, in its present condition, some objectionable features, but these, in his estimation, are entirely counterbalanced by its advantages. These defects will certainly be overcome. The principal objection to the employment of these instruments is the necessity of using a galvanic battery, which is supposed to be attended with great difficulties by those who are not familiar with its operation. This is a mistake, although the common batteries in use are somewhat troublesome to keep in order. The existing defects of galvanic batteries for the purpose will soon be entirely removed.

The subject of "Operative Dentistry" was again resumed, and a report from the committee read by Dr. Cobb, the chairman. We give a synopsis of the report, as follows:

The report called attention to the fact that we Americans are a fast people,—too fast in some things; and we, as American dentists, are liable to the same charge. Our discoveries and progress lead us into extremes; and our best practitioners are to-day going to extremes. Non-cohesive gold has been abandoned; colleges graduate students without instruction in its use. It has been well tried, and strangely abandoned. Cohesive gold has not been tried half as long. When it has, a bad story will be told. Ten years' observation shows that it will not preserve teeth as long as will non-cohesive by one-third. It cannot be adjusted to the walls as well. Fletcher deserves credit for his experiments. Cohesive gold will not stay in cavities with smooth, perpendicular walls, as is well known, without drilling deep pits and holes, but they can be filled with cylinders or blocks. Cohesive gold takes more time, aside from that occupied in adjusting the rubber dam, which is very inconvenient and unpleasant to the patient. An assistant must be at hand, and all these things must be paid for, to which our patrons justly object. Cohesive gold, however, has its advantages for a certain class of operations, such as contour fillings, but they are not very numerous. We should be prepared to use it well, if at all. Building up and restoring every tooth is a great mistake, and carried to an extreme. If these fillings were long-lived, we should take more interest in them.

The report then spoke of the mallet, and concluded that it would soon pass out of use to a great extent; so much malleting is not good for teeth. Do not abuse engines and other good things; some parties are already doing so. Steam-engines had been spoken of, which were certainly an extreme.

The report then spoke of the materials for filling teeth, which are presented in every conceivable shape and form. The writer had experimented with platina blocks and foil, but found them not sufficiently cohesive, and feared they would prove failures. As to amalgams, it was doubted whether we had as good an article as twelve years ago. A better cement filling than we have is called for,—one that would be durable and harden under water would be the greatest gift to the people ever offered by our profession. Rocks cemented centuries ago are firm yet, and it is strange that we cannot find something to stop holes in teeth for ten or twelve years.

The report then spoke of the covering of exposed pulps, and highly recommended a paste of the oxide of zinc and creasote, as promising to supersede everything else. It is used the same as the ordinary oxychloride, and covered with a temporary filling of that material. It has been used two or three years with great satisfaction. Dr. King, of Pittsburg, was the first to use it.

Dr. Arthur replied to Dr. Morgan's strictures. He thought the

system he advocated would stand if not subjected to any more formidable attack. It was a mistake to say that he (the speaker) stood alone in advocating this practice. Some of the best men in New York and Philadelphia had adopted and indorsed his views; he has received letters from all parts of the country to the same effect. The gentleman had stated that the book was full of contradictions. He (Dr. A.) begged to say that persons of at least equal intelligence with the gentleman differed very widely with him in that opinion. He referred to the fact that in a review of the book in question by Dr. Judd, now present, it was stated that the reader was led on step by step to make admissions, until he found himself yielding assent to the entire argument. Disclaiming egotism, Dr. A. would venture to state that a judge, in the city where he resided, who had read it, had asked him if he had studied law, and informed him that it read to him all through like a lawyer's brief; the facts were stated, the premises laid down, and the conclusions drawn so clearly as to force one to admit them to be correct. His theory was no new thing; it was the result of a life-time of observation. Instead of rushing upon it, he has stepped cautiously, and, though he has practiced it more or less for twenty-five years, it is only during the last ten that he has adopted it fully. It was his opinion twenty-five years ago that the system now worked out was correct, but he would not venture upon it rashly. If it is to be successful, it must be applied early, or its advantages are lost. He does not claim inspiration, as Dr. M. has intimated, but believes himself to be able to trace the connection between cause and effect. If the character of the teeth at an early age is considered, certain results can be foreseen by any one who is not willfully blind. He does not disregard the condition of the health, or of the secretions; a great difference exists in teeth. An opinion can be formed by referring to the teeth of parents. Children do not usually have good teeth unless the parents have. He has found that if the incisor teeth are decayed at the points of contact before twelve years of age, not five per cent. will escape caries on all the approximate surfaces except the lower incisors. Few persons escape dental caries in civilized countries; twenty per cent. would be too large a proportion for perfect dentures. It is necessary to success that the last traces of the decay should be removed if this treatment is attempted; with our means of examination it is nearly impossible to detect these remains, and all cases of failure he attributes to that cause. A great outcry has been raised because he proposed to file sound teeth. It is very difficult to find sound teeth at this day. Decomposition commences at once on eruption. He can tell without failing once in a hundred times when caries will occur in the bicusps and molars. When we wait till decay is visible to ordinary inspection the condition ~~is~~ is seriously injurious, and his system cannot be applied. He

abandon this practice till some better way is discovered. Even when failure does occur, you have only to fill afterwards, and it would be an advance on the present method if it failed in every instance, because the surfaces of teeth so treated would be visible, and the appearance of decay could be at once detected. Every one must either adopt or refute this system; there is no way out of the dilemma. The enamel has greater power of resisting decay than dentine; that is, if two surfaces of dentine are brought into contact, they would decay sooner than enamel under the same circumstances. The matters spoken of by Dr. Morgan are minor ones, and are not worthy of the exceedingly earnest and bitter criticism they received. Tomes did demonstrate the presence of fibrillæ in the dentine. As proof that filling is about the only means relied on to arrest decay, he would say that the late edition of Harris refers to no other means, except casually to the file. During sixteen years that he has pursued the practice, he has not had occasion to extract or treat, so far as he recollects, a single tooth where the denture was intrusted entirely to his care. If this result can be secured, it is successful practice.

Dr. Judd. Such doctrines as are combatted in the chapter of the book on extraction of the sixth-year molars are rarely heard. He has attended the meetings of the American Dental Association pretty regularly, and no man has dared to advocate on that floor the indiscriminate extraction of these teeth; nineteen-twentieths of the profession hold no such doctrine. Some influence has been exerted by the publication of statistics proving that the first molars are lost in excess of other teeth. Such statistics do not take into consideration the difference in the time teeth have been in the mouth. At the age of eighteen the sixth-year molar has been in the mouth twice as long as the twelfth-year. Compared with the third molar, the difference in some cases is greater still. It will often be found at a given age that the first molar has done more service than any of them, and is often capable of more. The difference of opinion as to what Mr. Tomes claimed is explained by stating that he did discover the fibrillæ,—soft fibrillæ of some kind,—but did not claim that they are nerve fibers, though he thought they were. With regard to the book, it does not claim to be a new practice entirely. This method is almost as old as dentistry; it was one of the first methods in use for the preservation of the teeth; but it had fallen into disuse. Dr. Arthur did not originate, but he revived, the use of the file. Cohnheim has the credit of spreading the doctrine of the white blood-corpuscles, though others saw and described them before he ever saw one; although it was a fact of great importance, it had been forgotten, and Cohnheim revived it. So Dr. Arthur has brought this doctrine to life again, though it had not entirely slumbered. Dr. Arthur's ideas have probably been modified by contact with others, while his book has modified

the practice of the best practitioners; they use the method more frequently, though few are quite ready to adopt his extreme views. That the removal of tooth-substance will arrest decay is admitted; the question is simply as to the amount proper to be removed.

There has been a sort of rivalry to find the most cavities in a given denture; it has been an axiom that every cavity should be at once filled; but many fossæ and fissures in grinding surfaces are natural productions, and many are cut out that would have remained sound through life. He has seen this done; had seen a mouth with only three cavities (in his judgment) where some one else had said there were thirteen. Don't fill before decay commences; it is a provision against the future, and he objects to the book on this ground. Don't disturb approximal surfaces till decay commences; but when it does, no matter how slight, it must be attended to. Supposing you *can* tell where it will begin, wouldn't it be better to wait till you are sure that it has, which you can find out by separating without pain in a few hours?

The book makes a false impression as to the efficacy of filling; it would imply that it is almost a decided failure. But experience does not sustain this conclusion. There are plenty of good operators who will take charge of mouths, and will not lose one tooth in one hundred months in ten years; in fact, the loss of a tooth by a patient who is under control is almost unheard of. The book has brought out facts that have modified his own practice, and he uses the method to a greater extent than formerly.

Dr. Arthur. It is true that the permanent separation of the teeth for the arrest of decay is old, but it is new to push it so far. The old method was confined to front teeth, and there is little objection to that. The most important part of his (the speaker's) treatise is that in which he has urged general considerations; after finding caries in certain places specified, he is confident that it will attack all. Teeth of the same individual are generally of uniform structure, and subject to the same influences, and why should they not be alike subject to decay? A mistake in predicting may be made, but it will rarely occur. When you have come to certain conclusions, there is no necessity for waiting till decay occurs; on the contrary, delay is injurious. He does not say that the operation of filling will not preserve the teeth. It will; but the advantage of his system is that the operations will be comparatively painless. The dentine, at an early age, has no exalted sensibility; under the effects of decay it is sensitive, and many will lose their teeth rather than submit to the necessary operations.

Dr. Morgan regretted that his manner had been such as to be characterized as bitter; he had no bitter feelings, and did not think he was a bitter man. He was glad that Dr. Arthur had modified the statement

of the book, that his operations could be performed without actual pain. [Dr. Arthur here reiterated the statement that, if performed at a sufficiently early age, there would be no pain.]

Dr. Morgan. The most horrid of feelings under our hands is attributed to the file. The noise in filing the enamel is disagreeable, but in filing dentine there is necessarily pain. He, or others, had no ability to tell what teeth would decay in a child of twelve years of age; that child may not live a month, and if so you have inflicted unnecessary pain in separating. I don't think Dr. Arthur has as much confidence in his own system as he seems to have. He tells you that he can foretell decay, and yet insists (page 83) that the teeth should be examined once a month. His (the speaker's) language, as to the book being a "tissue of contradictions," was too strong. It is a valuable book, but it is full of contradictions. As to its resembling a lawyer's brief, it seemed to him that it *did* resemble one. Lawyers professed to tell only one side of a case; it was their business to take a one-sided view of things, and to suppress all facts bearing upon the other side. In this respect the book resembled a brief. Another very singular claim in the system was where it was claimed that all the failures under it were successes. If the tooth was filed, and decay was arrested, that was a success; and if it progressed, that was a success too. He did not understand that sort of logic. The assertion that every one must either disprove or adopt the system is incorrect. If he is satisfied that the system is wrong, it is no part of his business to disprove it. The gentleman, however, is bound to prove that the system is correct. As an observer he (Dr. Arthur) is unreliable; and if his facts are incorrect, his conclusions are also.

Dr. Arthur. What facts are misstated?

Dr. Morgan. On page 33 it is stated that enamel does not decay, and on page 34 that it has no power of resistance. "Well-formed enamel is denser and better capable of resisting decay than dentine." The gentleman claimed that filling was the only recognized means of arresting decay. He (the speaker) was taught to file in 1845, and has practiced it to some extent ever since. Dentists also recommend hygienic means, powders, and cleanliness. The great fault of this system is that it proposes operations when no decay exists; that is, to physic the well man. If this practice is justifiable with the file, it is with filling. He has not examined the last edition of Harris; but if no other means than filling are mentioned, it does not represent the illustrious author. He was an ardent advocate of the file, and had said to him, when operating in his (Harris's) own mouth, "Don't be afraid to use the file, young man." He prefers to remove very superficial decay without using the file. He could give cases where nearly all the teeth, though decayed, had been preserved. If the use of the file was

confined to teeth already decayed, there would be less objection to the method.

Dr. Arthur. Dr. Morgan attempts to criticise the frequent examinations Dr. A. has advised. The incisor teeth are regarded as a test, and must be carefully watched. He presses them apart to ascertain their condition. The facts that are claimed to be contradictions are stated in a limited manner. When enamel is in contact decay will occur. He has not denied that hygienic measures are useful. They are of great value, and if you can induce people to prevent decay in that way it is the best.

Dr. Freeman. An artist placed his picture in the market-place, requesting that each one should retouch what appeared to him imperfect; the result was that the picture was entirely blotted out. He then requested that the perfect points of the picture should be retouched, and the result was the same. It is easy to criticise other people's work. This book has good points as well as bad, and we should not blot it out.

Dr. Walker. Dr. Cobb's report said that there were one-third more failures with adhesive than with soft foil. The failures come from too rapid operations. They must be carefully performed either with soft or cohesive foil.

Dr. Knapp. We are too apt to record our successes and not our failures. Even if it be proven that teeth become sensitive, it is not enough to condemn the system. The book contains many good things, and should be in the library of every practitioner.

Dr. Forbes. This book is fascinating as a novel, and if a man does not digest it well he will become a convert. He had nearly fallen a victim to it, and should have done so had he not early been taught not to abuse the file, and warned against it by his preceptor. It was in that day the fashion for young ladies to have their teeth standing apart. It might be presumed that such men as Hayden and Arthur would not abuse the file, but the great danger is that young men who cannot discriminate will practice these teachings and do injury. Teeth have been more generally filed in Baltimore than elsewhere; the atmosphere there seems favorable to the file. Had this book been written as a text-book, to tell graduates when to file, it would have been the greatest work ever written; but it was not. He knew a lady whose teeth were filed *à la* Arthur thirty-five years ago, and were still sound; but in this case the dentine is as strong as ordinary enamel. It may be of service to some teeth. When done in the front teeth it produces a hissing sound in singing. [Dr. Arthur here protested that such separations were not *à la* Arthur.] He had filed the teeth of a patient in his early practice and had been cursed for it, and ~~had~~ relied upon the file since. If a man whose molars and bic

been filed is not reminded of Dr. Arthur every time he eats tough beef, "then I'll eat the book!" (Laughter and applause.)

The association then went into an election, to determine the time and place of the next meeting; the choice fell upon Nashville, but it was subsequently reconsidered and changed to Memphis; and the time, at first fixed for the last Tuesday in July, was subsequently changed to Mardi-Gras day (some time about the latter part of February).

Adjourned.

(To be continued.)

ILLINOIS STATE DENTAL SOCIETY.

(Continued from page 476.)

THIRD DAY.

THE forenoon was occupied with clinical operations.

In the afternoon, there being no essay on the subject next in order, "Treatment of Exposed Pulp," it was opened with remarks by Dr. Eames, of St. Louis, who said, If pulps were in a diseased and suppurated condition, he would in most cases decide to extirpate them. He first applies the dam, then removes as much as possible of the debris and suppurating surface, and applies arsenic in the crystalline form, pulverized for the occasion, directly upon the pulp; after which he covers this with cotton saturated in creasote, over which he lays a little dry cotton, and seals the cavity up with melted wax. This application he allows to remain for twenty-four hours, or longer in some cases, when the pulp is removed. If the broach does not bring the nerve with it upon being withdrawn, a few fibers of cotton are wound loosely around it, the broach reintroduced, and upon withdrawal the nerve usually comes with it. The less after-treatment such cases receive the better.

When the pulp is exposed and inflamed, applies an anodyne, such as comp. camph. tincture of opium, or a little aconite, camphor, or dilute carbolic acid. Would not often make applications of escharotics if he desired to preserve the pulp alive. Sometimes uses dilute carbolic acid in cases where the nerve has been exposed for a time, the surface of exposure being in a suppurating condition. When the exposure merely occurs in removing the decay, he would apply the anodyne and wipe out the cavity with chloroform, after which he introduced a solution of Hill's stopping in chloroform, and as soon as the chloroform has evaporated covers this with a Hill's stopping or oxychloride of zinc filling, if he does not fill at once with gold. Has had better results with Hill's stopping as a covering for exposed pulps, when applied in this manner, than any other substance he has tried.

Dr. Kilbourne desired to call attention to the danger of over-medication of pulps exposed by decay or excavation. Every irritant that would in the least retard the operations of nature should be carefully removed.

Prof. Taft. The vitality of the teeth depends largely upon the living pulps, and they should always be saved alive, when possible. In attempting this, the systemic condition of the subject and his recuperative powers must be taken into account, as even the slightest exposure of the pulp concerns the whole and is influenced by systemic conditions. . . . He has found the body of the pulp in molar teeth so diseased as to compel removal, and yet preserved the portion in the roots without suppuration. Sometimes, depletion or counter-irritation may be demanded; at another time, sedative applications, or both. Depletion may be effected either upon the surrounding tissue or by puncturing the pulp with a sharp, small instrument. When the pulp protrudes in the cavity of decay he cuts off the protruding portion; has also for this purpose employed chemically pure nitric acid, and produced an eschar, which he afterwards removed. Frequently employs the pepsin-treatment before filling. Materials for filling an orifice of pulp-exposure should be of such a nature as to be applied so as to occupy all the space, but without making pressure upon the pulp.

Dr. Forbes. The position of the cavity of decay that exposes the pulp would very much influence his treatment. If in the distal surface of the second molar, has little doubt but that he should employ arsenious acid at once, in order to save the tooth. If in a subject of bilio-nervous temperament, with decay upon mesial surface, and the tooth had ached over-night, should lift off with a trocar all decay from the surface of the pulp, and apply chloroform, laudanum, paregoric, or creasote and glycerine, and cap it with whatever comes most handy, so it be a non-conductor; after which fills cavity with oxychloride of zinc, and cuts away the walls of cavity so as to give free access, using the second bicuspid, if in place, as a fulcrum. Many years ago he used leaden disks, lined with common glue, for capping pulps. He had been expecting an improvement in oxychloride of zinc ever since its first introduction, but was sorry to say that the oxychloride of the present day was not equal to that first furnished; but he expressed the belief that many of the members present would see the day when a material similar to it would save a tooth as well as any material now in use. In case of a very negligent patient so far as care of the teeth is concerned, and the tooth having pained for three or four weeks, he thought it would be ten chances to one that he would extract the tooth.

Discussion of the subject was declared closed.

Dr. Forbes then extended an invitation to the gentlemen present to attend the meeting of the Southern Dental Association, on July 26th,

at St. Louis; after which a ballot was taken for the next place of meeting, and Ottawa was declared the choice. The society then adjourned.

Evening Session.

An essay on "The Changes in the Shapes of the Teeth that are necessary or proper for the Treatment of Decay," by Dr. E. Noyes, of Chicago, was then read by the secretary. The following is a very brief extract: "Nature is doubtless perfect in her work whenever she is able to work up to her perfect ideal, and from her best specimens we shall learn the principles that will guide us and find the models towards which we must work in all the changes which we venture to make in the forms of the teeth. . . . We must seek for general principles and models by a study of the forms and arrangement nature has adopted in the dentures which we find least subject to decay. We shall find such teeth convex in every part (outside the alveolus) except the grinding surfaces, and with what may be described as bell-shaped crowns. . . . Whenever teeth are cut in operating upon them, we almost inevitably leave nearly plane surfaces, and the obvious inference from the form the best teeth possess naturally is that what we cut away should be cut in several planes, and so that the surfaces of adjoining teeth shall always be divergent from each other." . . .

Discussion being declared in order,

Dr. Cushing. The paper said that nature would guide us as to form. It strikes him that we have not much to do with nature's forms, as nature does not intend to have the teeth operated upon at all. We find them in an unnatural condition, and our aim should be to overcome these unnatural conditions, which tend to their destruction. To this end the importance is great of giving them such forms as will best tend to protect them from injurious influences. Cases are so various in different mouths, and shapes of teeth differ so much even in the same mouth, that what would be a correct form in one case would certainly fail to prevent the liability of decay in another. The importance of proper space in operating is oftentimes overlooked, and this is the cause of many failures. Observation leads him daily to a stronger conviction of the value of Dr. Arthur's method, judiciously applied,—that is, to have free spaces of proper shape between the teeth; and this conviction is growing with many of the older practitioners. He did not feel qualified to say that he has had sufficient observation to speak authoritatively of that method, but he felt certain that those who did pursue that plan save more teeth than those who practice contour filling entirely. Many who condemn Arthur's method do so hastily.

Dr. Low. Would you agree with Dr. Arthur as to the prevention of decay by cutting if there were certain indications?

Dr. Cushing. If there were indications of decay, I should certainly cut. There certainly is no objection to cutting away the distal surfaces in the deciduous molars for the purpose of preventing decay of the anterior surfaces of the sixth-year molars.

Dr. Sturgiss has practiced separating to some extent on superior incisors in removing incipient decay. Is not ready to say that the old-fashioned manner of saw-teeth separations did not save some teeth, but he separates gradually with cotton, and fills so that if the teeth should come together again the gold surfaces should touch. Does not believe that this system of Dr. Arthur's would ever be universally adopted as applied to all the teeth.

Dr. Kitchen. Dr. Arthur's system has some strong points in its favor, the great objection offered against it being that food would crowd in the spaces between the teeth and become very annoying. He had a tooth filled in that manner last year, and has not been troubled in that way. Decay upon the proximal surface of a tooth is often arrested by the extraction of its adjoining tooth. Why cannot creating a free space for this purpose by means of cutting accomplish the same end?

Dr. Kilbourne believes in wide separations, and especially between bicuspid. We have always been too much afraid of cutting, and by allowing the teeth to go together again after operating they have often been rendered worse than before.

Dr. Black. The shape of the proximal surfaces is very important. In teeth with narrow necks and long crowns we may cut a large V-shape looking toward the inside, and still keep them apart, but in thick, short teeth we must make a V looking inward and toward the grinding surfaces. The practice of making square separations between the incisors not only *looks* bad but *is* bad. The corners should be so rounded that persons would scarcely know that the tooth had been operated upon. In the lower molars he prefers to make the V-shaped opening facing outward. The cutting should be done mostly from the anterior surface of the posterior tooth. In the upper molars he should do most of the cutting from the posterior surface of the anterior teeth, and have the V-shaped opening face inward.

Dr. K. B. Davis thought that if we could look upon the matter of separating teeth according to Dr. Arthur's method divested of all prejudice, we should feel differently about it. He has separated teeth ten years ago that have not decayed since; has practiced Arthur's method very much lately upon the front teeth, and he thinks with great success. We should not be deterred by pecuniary considerations from making these separations in preference to contour fillings when the best interests of our patients demand it.

Dr. Harlan has some teeth in his own mouth with V-shaped separations, and experiences no inconvenience from them. Between bicuspid

should cut from the posterior surface of first bicuspid rather than from anterior of the second, as it would look better.

Dr. C. S. Smith objected to the method of treatment advocated by Dr. Arthur, because it involved serious difficulties both in theory and practice. It is true that Dr. Arthur tells us that his theory is based on the results of twenty-five years of practice of the method. But twenty or twenty-five years ago the teeth of adults were of far better quality than those now presented for treatment; we are constantly finding the teeth of children seven to nine years of age so much decayed as to be beyond the reach of this practice. If he might make use of a Latin term without being pedantic, he would say that we are too apt to mistake a *post hoc* for a *propter hoc*, or a thing which happens *after* another for a thing which happens *on account of* another. "A tooth has been filed; that tooth does not decay,—therefore filing is a proper practice." This is superficial and illogical. He would not change the shape of the tooth materially; agrees with the paper that it is our duty to restore the form that nature gave; if we destroy the shape of the teeth we destroy in a measure the usefulness of the organs. . . . The anterior teeth may be very considerably cut away without interfering materially with their external appearance, or their effectiveness in incising or articulating. If we follow the practice in the back teeth we reduce the denture from a set of millstones to a row of pegs. A further objection to this method is, that it requires conditions that are quite impracticable. The children must be presented at the earliest age and at stated times, and the appointments made weeks or months in advance must be kept, or the system is a failure, according to the author. Now, we know that children are in ordinary practice rarely presented until after some of their teeth are so far gone that it is next to impossible to save them. If we who practice filling teeth in place of filing could see our patients as early and as regularly as Dr. Arthur requires, the loss of the teeth with us would be a rare occurrence. The file in injudicious hands is a most dangerous instrument, and a good degree of skill must be necessary to carry this method into execution. Another impracticable thing required is absolute cleanliness. The author admits that unless floss-silk, etc., are used daily, or oftener, the system will fail. Now, who of us is there, knowing as we do that we are dependent on cleanliness to save our teeth, that uses floss-silk or rubber dam between his teeth after every meal, or anything approximating to it? We don't do it, and our patients, or a majority of them, won't do it.

Dr. Morrison said that with our present facilities for gaining space between the teeth, and the delicate and suitable-shaped instruments for performing these operations, the practice of cutting away the tooth-substance so extensively was highly censurable, though he does not

include under this head the shallow varieties of decay. Very much depends on the instruction given to patients in the chair with regard to the cleansing of the spaces by the frequent use of tooth-picks and thin strips of rubber dam, which advice, if taken in time, will prevent decay, and also the recurrence of decay, in many cases where good fillings have been made.

Dr. Black only spoke of how he should cut if he determined to cut at all, but is still an advocate of contour fillings where he deems them judicious, and does not consent to cut indiscriminately; perhaps he would not change the shapes of teeth much in most cases, but does more of this on lingual surfaces of upper incisors.

Dr. Cushing thought there was a wrong impression as to what he advocated; it was not *indiscriminate*, but *judicious* cutting that he was in favor of, and although he favored leaving wider spaces more than he formerly did, yet under favorable circumstances he was not opposed to contour fillings.

The objection to the lodgment of food in spaces where the decay is polished off is no more valid than in cases where the cavity has been filled with gold. It is possible that the separations in the minds of some of the critics are not at all of the same nature as those advocated by Dr. Arthur, and he would venture the prediction that both Dr. Smith and the gentleman from St. Louis would modify their views in regard to wide separations after ten years of added experience. Dr. Arthur himself disavows indiscriminate filing.

Dr. Butler. Cleanliness seems to be the great essential to success, according to Dr. Arthur's book, in his method; if we had this we should have success also. Time alone will determine whether liberal separations or contour fillings are best. Possibly the mode of practice ten years hence will be a modification of the old method and that of the past eight or ten years, and cases will be treated more individually, and less according to any system of treatment. He obtains space mostly by means of compressed cotton-wool wedges which he introduces after the dam is in position; he then wets the ends of the wedges and relies upon the expansion of the wool during the time occupied in the preparation of the cavity. Or if slow wedging is desirable, these wedges can be left between the teeth for a long period of time without becoming as offensive as cotton would.

Dr. Eames does not believe in Arthur's method to the extent practiced by the author; is of the opinion that there are many cases of incipient decay which by a judicious application of that method may be removed and the teeth left in a better condition than by the usual method of filling. He believed that the lodgment of food in the spaces, and liability to soreness and pain of the teeth in consequence of ~~the~~ practice of this method, are generally due to the injudicious se'

of cases for its application, and the faulty shapes in which the teeth are left after being cut away. A V-shaped space with plane surfaces is favorable for the retention of food at the neck of the tooth; the cutting should be so made as to leave a rounded face from the lingual to the buccal surfaces; the outline of the neck of the tooth should be followed down to the cutting edge.

Society then adjourned.

(To be continued.)

GLEANINGS FROM DISCUSSIONS OF THE DISTRICT DENTAL SOCIETY OF THE FIRST JUDICIAL DISTRICT OF THE STATE OF NEW YORK.

BY J. S. LATIMER, D.D.S.

(Continued from page 426.)

DR. ATKINSON stated that he had found Mack's screws have too fine a thread, and hence a weak hold upon the dentine. The screw should be more on the principle of those used for wood-work. He has the electrical engine, and likes it much. The pneumatic is very effective, but is noisy, and requires an assistant to run it.

W. M. Reynolds, M.D., since hearing the paper read on "Amalgam," by Dr. Ambrose Lawrence before the American Dental Convention, had experimented somewhat, and had come to think more favorably of amalgams.

Prof. Bogue hoped other members would experiment and report. Dr. Lawrence had stated in his presence that the components of his amalgam are pure silver and pure tin. It has been claimed by experimenters that no proportions of silver, tin, and mercury could form a non-shrinking amalgam. It should be remembered that Dr. Lawrence has a large monetary interest involved in amalgam and its reputation.

Prof. Atkinson inveighed strongly against "Arthur's method," and censured those practicing it.

Dr. Bogue asked what he would do with very soft and rapidly-decaying teeth of young persons—the cavities already numerous.

Dr. Atkinson replied that he would polish off the enamel where the caries was superficial, and would fill and restore the contours of the other carious teeth.

He added that if we are to follow the law of morphology, we might almost be excused for removing the four first molars whenever it becomes necessary to extract one. Dr. Reynolds had lately seen one of Dr. Arthur's patients whose teeth had been cut away very much and very well. The patient was well pleased with the results, but it would be unsafe to say the teeth were not deformed.

Benjamin Lord said he was not uniformly successful in saving the

teeth of children by filling proximal cavities; nor, when the pulps of the deciduous teeth are exposed, is he generally successful in rendering them comfortable.

He cuts out superficial caries and polishes the surface. He is glad the profession is turning its attention to the prevention of caries. He would even save the roots of temporary teeth until the time for their replacement, and would by no means sacrifice the sixth-year molars. Commended tin as excellent for stopping children's teeth. *Why* tin and gutta-percha act so well in soft and frail teeth he could not say, but he was satisfied of the fact.

Geo. A. Mills would on no account extract a sixth-year molar for a child, if he could save it. The fact that such a tooth was affected with acute peridontitis would not tempt him to apply the forceps to it.

Dr. Kingsley arose to dissent from the views of his friends Lord and Mills. The saving of the roots of deciduous teeth, and insisting on the retention of all of the sixth-year molars, was carrying that matter to an absurd length. The removal of the teeth and roots does not interfere with the growth of the jaws, and does prevent irregularity.

He did not wish to be understood as favoring indiscriminate extraction, but, judiciously performed, it prevents caries and does not generally lessen the utility of the teeth, by preventing the proper occlusion of the twelfth-year molars. He does not separate teeth by pressure, but cuts them apart, and leaves the cut surfaces self-cleansing.

F. H. Clark agreed with Dr. Kingsley with reference to the tipping of the twelfth-year molars, when those of the sixth year have been removed in pairs and at the right age. He prefers tin for filling not only the deciduous, but all soft teeth.

C. P. Fitch, M.D., stated that, in his opinion, the removal of the sixth-year molars does, in some cases, cause the forward inclination of the twelfth-year molars; but the development of the jaws is not impeded by such removal, as the new processes are formed around the new teeth.

Dr. Francis would not permit a child to go from his office with an aching tooth: he would see that the tooth was first made comfortable. If carbolic acid failed to give relief, he applied aconite and chloroform; and, if that prove insufficient, he bled the pulp and then applied carbolic acid. He devitalizes few pulps, and never applies the arsenical paste to a tooth when aching.

Dr. Abbott never employs arsenic in children's teeth, because afraid it will kill beyond the canals of the roots. Creasote and tannic acid generally suffice to render the pulp non-sensitive with one or two applications.

He does not fill the canals of deciduous teeth, but places a pellet of cotton in the pulp-cavity, and covers it with a mixture of red gutta-percha and wax, carefully applied so as not to produce pneumatic

pressure upon the parts beyond the foramina. He cannot succeed with tin in the mouths of very young children, for whom he preferably employs amalgam.

The president, O. A. Jarvis, M.D.S., uses no arsenious acid in the teeth of children, but finds that two or three applications of creasote answer for obtunding treatment.

Dr. Fitch saves the deciduous teeth as long as he can. Extremely minute quantities of arsenious acid suffice for devitalizing pulps, and he uses it for adults; but for children he employs the mixture of tannic acid and creasote, which, in his hands, requires from two to ten days for the devitalization of the pulps. He removes the pulps from deciduous teeth, but does not fill the canals of the roots.

Dr. Atkinson does not understand how tannin can devitalize pulps, as it can unite with only dead tissue.

He is opposed to the use of arsenic in teeth. Thinks it produces its effects by combining chemically with the nutritive plasma of the pulp. In handling extremely sore teeth, he lifts gently on them with thumb and finger, or by a strand of gilling twine, thus relieving the pain.

F. H. Clark, in a paper upon "Toothache," admitted that the forceps was still his most reliable remedy for that affliction.

He had formerly been in the habit of splitting open extracted teeth for the purpose of discovering the condition of the pulps and the causes of pain. He frequently found nodules of osteodentine imbedded in the pulps, which had been the undoubted causes of obstinate neuralgias. He heard other gentlemen talk so complacently of their success in the treatment of toothache and its happy results, that he had been led to wonder at the difference in experience. The gentlemen who invariably save teeth with exposed pulps without arsenic, are either so happy as not to meet with the osteodentine nodules, or they do not learn the subsequent fate of such teeth falling under their treatment.

Notwithstanding the maledictions hurled against arsenious acid, he still held the discovery of Dr. Spooner as a decided blessing to suffering humanity. He cautioned young practitioners against accepting, blindly, the leadership of enthusiastic extremists. Each man should use his own judgment in each particular case.

Dr. Atkinson said: Platinum is cohesive at a white heat, gold at a red heat. Heavy gold may be spread by "battering," and so adjusted to a properly-prepared wall. The question whether it is cohesive or adhesive is non-essential. For the purpose of showing that heavy gold is adjustable, he had often introduced mats made of several thicknesses of No. 120 foil, and welded them with smooth points and mallet force. He described a case of epithelioma which he had under treatment. The patient was just at death's door on presentation; but, under the administration of condurango and the local application of pepsin, the

patient had greatly improved. It was stated that two of the teeth filled at the clinic that afternoon (March 3d) had secondary dentine formed over pulps that had once been exposed, and which had been protected by oxychloride.

Dr. Francis had formerly used cohesive foils exclusively, for which he was very sorry. For some years past he has placed non-cohesive next the walls, and completed with cohesive. During a recent visit to Philadelphia, he visited several eminent operators, and found them all using much larger proportions of non-cohesive foil than formerly.

Dr. Fitch uses the cohesive exclusively, and prefers No. 4 to the heavier preparations because it is more adaptable.

George A. Mills uses smooth, oval points and heavy gold. He has no difficulty in adapting the gold to the walls, and believed it spread under such points, in the manner described by Dr. Atkinson.

H. Albert uses foil of Nos. 4, 30, and 60, filling the cavity half or two-thirds full of No. 4, and finishing with the heavier foils.

Dr. Hoag read an instructive paper, from which we glean the following:

All normal dentine is slightly sensitive, except, possibly, that in the teeth of old people whose pulps are atrophied; in such, the tubuli are consolidated by filling up with calcific material.

Dentine differs from bone, in that it contains long processes of cells in its calcified matrix, which matrix is traversed by numerous fine canals (tubuli) in which lie the dentinal fibers. As a rule, each tubule extends from the pulp outwardly to the enamel, giving off fine lateral branches in its course, which anastomose with those of adjacent tubuli. On the surface of the pulp is a layer of larger cells called odontoblasts, of elongated forms, and provided with numerous processes, which (some of them) penetrate the tubuli. According to Bell, the fine branches of the dental nerve accompany these processes into the tubuli. Mr. Bell, however, was unable to verify his hypothesis of the accompanying nerves.

Whether to the cell-processes themselves, or to accompanying nerve-fibers, is due the sensibility of dentine, the fact of sensibility cannot be successfully disputed. To treat abnormally sensitive dentine, we should first remove the cause, and then protect the part from further irritation. Hill's stopping answers well as a temporary filling for protecting the surface from corrosive agents. In a few days the parts so protected will take on a healthier action, and may be cut with very much less pain than at first.

Dr. A. C. Hawes read a paper on "Sensitive Dentine." During the discussion which followed, he explained that he applies the rubber dam, dries the cavity thoroughly, places a pellet of cotton in the car¹ has been wet with tincture of aconite-root; or he places a li¹

thin sheet-wax over the surface of the tooth, so as to protect the sensitive cavity, which has been wetted as described; then, having protected the lips with napkins, throws the spray of rhigolene or ether upon the tooth gradually, until sensibility ceases. Sometimes lets his assistant spray while he cuts.

Professor Littig recommended the application of nitrate of silver to sensitive dentine. He dries the surface, then applies the concentrated solution, after which he submits it to the action of light before cutting, by which he prevents subsequent discoloration beneath plugs.

Professor Atkinson said the nitric acid is set free and acts upon tissues, while the oxide of silver remains as a stain. When desired, the stain may be removed with a concentrated solution of cyanide of potassium. Nitric acid, in very minute quantities, will answer equally well. A very good way to apply the nitrate is to touch the sensitive surface with a silver wire dipped in nitric acid. He had that day applied carvacrol in an extremely sensitive cavity, and with the happiest effects. Abstraction of water renders dentine much less sensitive. Pain is consequent on vibration.

Prof. Abbott has two or three patients who sniff ether while having sensitive cavities excavated. He finds that cavities dried, wet with creasote or thymol, and then filled with gutta-percha, lose their sensitiveness in from two to four weeks.

Dr. W. M. Reynolds recently excavated an extremely sensitive cavity for himself, and, of all the remedies tried, chloroform answered best.

J. S. Latimer dries the cavity thoroughly, then saturates the sensitive dentine with carbolic acid, and fills with oxychloride. Excluding the irritating causes for a few days permits the return of a healthy condition. He read a note from Messrs. Townsend and Matthews, recommending a paste of tannic acid and creasote for sensitive dentine. He also read a note from Mr. Fletcher, of Warrington, England, admitting the permeability of enamel and dentine by fluids, and stating he had been embarrassed in his experiments for testing the moisture-tightness of plugs by such permeability, so that he had been compelled to resort to covering the surface of the tooth with varnish. Before resorting to varnish he had been led into serious errors.

At the meeting held May 5th, the Clinic Committee reported that the public clinic had been one of unusual interest, at which Drs. Searle, of Springfield, Mass., Riggs, of Hartford, Conn., and Serre, of New York, operated. The first-named gentleman filled a superior bicuspid, with a large proximo-grinding cavity and a pulp that had been so nearly exposed that it had ached and had required treatment. After capping with oxychloride, he partially packed three or four soft pellets against the cervical wall, and then inserted a wedge gently, and just sufficiently pressing upward against the gold to hold firmly *in situ* until, with

cohesive gold, he had connected the pellets already introduced into one mass, thoroughly condensed and well anchored. The wedge was then removed, and the operation completed with cohesive gold in the usual manner. Of course the rubber dam was placed upon the tooth before the oxychloride was inserted. Dr. Riggs illustrated his method of removing calcareous deposits upon the roots of teeth. In reply to interrogatories, he stated that such deposits are consequent on constitutional causes, but the only treatment required for their eradication and the cure of the consequent disease of the gums and processes is simply the removal of the tartar, followed by an astringent lotion, such as tincture of Peruvian bark or tincture of myrrh. When the margins of the processes are necrosed, they must be scraped down to the living bone. The doctor's scalers were long and slim, yet strong, and with large handles.

Dr. Serre filled for a lad a molar with a nearly exposed but healthy pulp. The rubber was first applied, the cavity thoroughly dried, then the walls saturated with carbolic acid, after which the tooth was filled with gold in the usual manner.

On the subject of "Moisture-Tight Plugs," J. S. Latimer stated that he and Dr. Serre had repeated the experiments of Mr. Fletcher, but without confirming that gentleman's theory. Plugs made with cohesive, and others with non-cohesive, gold alike excluded the ink.

Dr. Fitch, while admitting that non-cohesive foil is the more adaptable, finds no difficulty in adjusting cohesive gold to the walls.

Drs. Searle and Riggs were given a vote of thanks for their instructive clinics, and were made honorary members of the society.

At the June clinic, Dr. Salmon, of Boston, operated.

Dr. Jarvis exhibited an instrument, devised by himself, for separating teeth. It is cheap and simple, but effective, giving access to proximal surfaces of crowded teeth in a few minutes, sufficient for examination. There is no injury to the gums, and very little pain in the process.

The clinics have proved a valuable feature of the society's work.

NEW JERSEY STATE DENTAL SOCIETY.

THE fourth annual meeting of this society was held at Mount Holly, on the 14th, 15th, and 16th of July, 1874; the president, Dr. J. W. Cosad, Jersey City, occupying the chair.

The following officers were elected to serve the ensuing year:

President.—Dr. Geo. C. Brown, of Mount Holly.

Vice-President.—Dr. R. V. Jenks, of Paterson.

Secretary.—Dr. J. W. Scarborough, of Lambertville.

Treasurer.—Dr. Wm. H. Dibble, of Elizabeth.

Papers were read as follows :

"Alveolar Abscess," by Dr. W. E. Pinkham ; "The Morrison Engine," by Dr. E. M. Beesley ; "Contour Fillings," by Dr. J. Chadsey ; "Dental Instruments and Appliances," by Dr. J. Hayhurst ; and "The Inter-relation of Medicine and Dentistry," by Dr. S. E. Arms.

Dr. Stockton, one of the committee appointed to test the merits of new instruments and appliances, reported very favorably of a new saliva pump, sent by S. S. White ; also of an improved celluloid apparatus, which he found to work well. I. Smith Hyatt, Secretary of Celluloid Manufacturing Company, mounted a celluloid case before the members of the society ; the work was completed in half an hour's time, and to the entire satisfaction of those present.

A committee was appointed to inquire into the working of the Backus water motor, in use by Dr. George C. Brown, of Mount Holly ; they made a favorable report.

They also examined and reported favorably of an invention of Professor George T. Barker, the design of which is to prevent burs and wheels on the engine from becoming heated while in use.

Adjourned to meet at Long Branch, on the first Tuesday in July, 1875, instead of the second Tuesday, as heretofore.

J. W. SCARBOROUGH, *Secretary.*

CORRECTIONS.

In the report of the proceedings of the State Dental Society, held at Wilkesbarre in July last, I fear that the unqualified support of the pink rubber as a material for filling teeth, which I am there represented as giving, might lead some one to suppose that I was recommending it for a permanent filling, while my intention was to speak of it only as a substitute for some less desirable material used in temporary operations. And for that purpose I might here reiterate that I do think it possesses advantages making it superior to other materials used for such purposes.

C. N. PEIRCE.

In the report of the proceedings of the Pennsylvania Dental Association, published in the September number of the DENTAL COSMOS, I am reported as saying that "gutta-percha is as good as gold." This report does my opinions and language injustice. What I said was, that after a test of at least twelve years, gutta-percha, such as is used for base-plate plates, is the best material of that character for temporary and, in many cases, for permanent fillings, and is far preferable to a poor gold filling.

W. G. A. BONWILL.

EDITORIAL.

WE are compelled in the interests of our readers to give an unusual amount of space to the very full and interesting reports of the national associations and convention. Correspondents will find in this statement the reason of the non-appearance of their favors for the present.

OBITUARY.

DR. GEORGE E. HAWES.

DIED, at Wrentham, Mass., Aug. 21st, 1874, Dr. George E. Hawes.

Dr. Hawes was an honorable, kindly, manly man. He possessed in an unusual degree the confidence and affection of his professional acquaintances, and will long be held in kindly remembrance by them.

VULCANITE LITIGATION.

SINCE our last mention of the suit against Dr. Smith, and its decision by Judge Shepley, the final decree has been entered in conformity with that decision and with the proceedings taken thereupon, and this decree bears date August 18th, 1874.

Since that time all the necessary formalities have been complied with (the supersedeas bond filed, etc.), and an appeal to the Supreme Court of the United States duly perfected, thus arresting the execution of the judgment against Dr. Smith.

Between the taking of an appeal and the hearing of it, it is well known a considerable time must elapse, because the docket of the Supreme Court is always a long one, and cases, as a rule, are heard in numerical order. We have therefore only to wait until Dr. Smith's turn comes. When a case is argued the Court decides it very promptly. Nothing can be done to hurry it, and it only needs that the profession bear in mind the foregoing facts whenever any suggestion occurs as to why the appeal is not heard of for a season.

At this point we deem it proper to add a word. During the somewhat similar interval that has elapsed since the decision by Judge Shepley, all sorts of assertions, statements, and surmises have been made or indulged, and have reached us through divers channels, coming from parties interested in one way or another, and having an object or purpose that could readily be comprehended. The word we wish to add is simply that since the decision by Judge Shepley nothing has

been done in the Smith case, except with a view to obtaining the final decree on the one side, and the securing of an appeal on the other; and in the latter proceeding the ten days allowed by law, from August 18th, were more than sufficient. Thus at the earliest practicable moment the case has been placed in train for ultimate disposition, and the programme originally contemplated, in the stipulation adopting this as a test case, fully and promptly carried out up to date.

Furthermore, in regard to the cases in other circuits where Judge Shepley's opinion has been adopted and acted upon, this also was contemplated in the acceptance of a test case, and the proceedings elsewhere, in what may be called these collateral cases, have simply been the natural and expected consequences of the Massachusetts decision.

As we understand it, the Michigan cases are governed by a specific stipulation applying exclusively to them (as the original stipulation in the Smith case applied only to the Pennsylvania, New Jersey, and Delaware cases), and are awaiting a hearing in Michigan (as the other cases awaited the hearing before Judge Shepley), all further proceedings in that circuit being suspended until such hearing and decision.

Since the appeal of the Gardner suit was dismissed and the mandate recalled by the United States Supreme Court, on the ground that that suit both below and above was *merely collusive*, the conduct of the defense has been in harmony with the purpose resulting from the desire then expressed by leading men in the dental profession, that the undersigned would take charge of the preparation, illustration, and presentation of the processes, and products of those processes, which had been in public use and on sale by the dental profession long before the alleged claims of invention by Dr. Cummings, and which had so strangely been omitted from the Gardner record, although their effect has been at least to change the character of the patent entirely, as now construed both by the Company and the Court. The Goodyear Dental Vulcanite Company declining to argue the original cases in this circuit, permitting their preliminary suits to go by, paying the costs and renewing them again, their offer to make the Smith case the test case was accepted, as affording the earliest opportunity of having the matter heard on its merits.

The case having been fully presented before a Circuit Court, and having now been appealed to the Supreme Court without delay, will be finally argued there in its turn.

It will therefore be evident to the profession that there has been no disposition to provoke litigation, and no litigation resorted to further than was necessary to present the facts properly for conclusive adjudication.

SAMUEL S. WHITE.

THE DENTAL COSMOS.

VOL. XVI. PHILADELPHIA, NOVEMBER, 1874.

No. 11.

ORIGINAL COMMUNICATIONS. DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the Office of the Librarian of Congress at Washington.]

(Continued from page 509.)

ALTHOUGH much discussion has been devoted to the theories in relation to *sensitive dentine*, and although two diverse and ingenious explanations have been offered in reference to this matter, it has always seemed to me that there was little practical difference between the assumption of the existence of true nerve fibrillæ emanating from the dental pulp, and extending through the organic portions of dentinal tissue, capable of receiving and directly conveying impressions to the nerve of the pulp, and the other theory of organic filaments analogous to nerves, extending, like the so-called nerve fibrillæ of Tomes, from pulp cavity to dentinal periphery, and endowed with a sentiency analogous to nerve-tissue, for which reason I early adopted the Tomes theory, as offering the most reasonable and most complete explanation of all the varied phenomena which we *knew* to exist in connection with this condition.

It was for a time contended that even enamel was possessed of sensation, but it is now generally conceded that whatever semblance of this function may be present, is doubtless due to excessive sensibility of contiguous tissue.

That this portion of the organic components of dentine should be thus endowed with excess of sensibility would seem to be merely analogous to what we always find in connection with sentient tissue, viz., that capability for response to irritation increases in proportion to the *attenuation* of the tissue. In special as well as general sensation this peculiarity is constantly noticeable, and thus it is that with the examples of the final expansions of the optic, auditory, and nerves, together with the point of the tongue, the ends of

and the *periphery* generally, as the locations for excessive sensibility, we find nothing surprising in the exquisite suffering which may arise from either mechanical, chemical, or vital irritation of that final expansion of terminal dentinal fibrillæ, which, together with altered mucous membrane, forms what is generally known as the subenamel membrane.

Thus it is, that although we may frequently notice marked sensitiveness of dentine over the entire surface of a cavity of decay, we nevertheless usually find that within the boundaries of a fine line just between the enamel and dentine it is decidedly most sensitive.

We also usually find *quite marked diminution of sensation in proportion as we leave the periphery of dentinal tissue and advance FOR A CERTAIN DISTANCE toward the pulp*, which fact should be carefully remembered as one of the most useful in connection with this subject.

It will be found that considerations based upon this circumstance form the key to nearly all that can be offered, and that as a means of diagnosis, together with affording all of the most reliable information during treatment, whether mechanical or medicinal, preventive, alleviative or curative, it is wonderfully important.

In discussing *sensitive dentine*, it becomes necessary to make a primary division of the subject into—1st, those cases which have no perceptible cavities of decay in connection with the other concomitant pathological conditions; 2d, those which are found in connection with superficial caries; 3d, those which combine considerations pertaining to simple caries; and, 4th, incidentally, such as compel attention to even those greater complications which associate with deep-seated cavities of decay.

Sensitive dentine is usually found in teeth which possess good general characteristics, and almost always is excessive in degree and difficult of treatment in proportion to the high quality of tooth-tissue. In deviations from this, it will be found that temperamental considerations exist which rank the individuals as *nervo-lymphatic* or *nervo-bilious*, and even in these cases it will be noticed that while the dentine is soft and perishable, *the enamel will be reasonably hard*, nicely polished, and quite compensating in durability.

It is, however, in the teeth of the *nervo-sanguine* and *nervo-bilious* temperaments that we find the instances of exceeding tenderness of dentine, together with corresponding difficulty in overcoming this obstacle to operating.

Symptoms of Sensitive Dentine.—Uneasy sensations; which may be located about the teeth, jaws, *cheeks, eyes, nose, or even lips*,—position of cause of trouble *not positively located unless touched*,—aggravation of suffering from salt, sweet, and sour applications generally; from hot and cold applications frequently; and from *touch* markedly, especially to *finger-nail* and metallic touch.

The response to irritation is of all grades, from simple uneasiness to exquisite and *unendurable* suffering, with the peculiarity that in some instances response to *touch* will occur repeatedly, and *IN OTHERS but one response* can be obtained until time sufficient has been given to the excitant of this condition to again induce a responsive state. This must always be remembered in making instrumental or other tactile examinations, and each successive *position of contact* carefully noted, lest, a repetition of sensation being denied by the diseased tissue, the exact location of irritation be passed over undiscovered.

It is not usual that hot, cold, salt, sweet, or sour irritants produce this temporary cessation of response, unless a forcible contact of the irritant is induced. This sometimes occurs during mastication, and affords the explanation of the fact that an intense momentary pang may result from occlusion of the teeth upon sweet or salt food, which pain cannot be reproduced upon the subsequent attempt of the individual to localize it.

It must be mentioned, in this connection, that such cessation of pain after masticatory induction, although usually quite prompt, is yet *not so instantaneous* as after instrumental touch, which touch must thus be recognized as *more absolute*; and it is from this fact that we are sometimes able in difficult cases of diagnosis to so direct the patients as to render them useful in aiding us to arrive at a correct conclusion as to location.

Thus, upon recurrence of pain, the patient, by request, will frequently be able to place a finger upon the tooth (if done quickly), while yet it is aching, and, with the aid of a mirror or a friend, designate the affected organ.

Having found the location of sensitive dentine, the special diagnostic is, prompt induction of pain upon application of irritant, and prompt cessation of pain upon removal of irritant; *instantaneous induction of pain upon touch of instrument, and instantaneous cessation of pain upon removal of instrument.*

Discussion.—1st. Cases which have no perceptible cavities of decay in connection with the other concomitant pathological conditions.

This peculiar combined systemic and local abnormality is by no means one of little interest or of little importance; indeed, it is quite otherwise; interesting from the stand-point of theory and practicality, it is equally important as being one of the most fruitful, and at the same time most obscure, causes for many of those painful and serious troubles which, having sought vainly for relief at the hands of the general, and even other special, practitioners, find that which they desire within the range of dentistry.

It is probably more particularly in this condition than in any other in pathology, that the dentist recognizes something, visually ~~imman~~

ble to all others, as quite sufficient cause for grave troubles which baffle the best efforts of skillful and experienced physicians.

It is in cases where obstinate, long-continued, and severe "neuralgic" trouble arises from sensitive dentine without perceptible cavities of decay, that examinations of the teeth are indulged in by the physicians in charge, and oftentimes sound and *very useful roots of teeth* are condemned to extraction, because cases are frequently recorded in which cures of like suffering have been accomplished by the removal of roots.

In these sensitive dentine cases, no cause of trouble having been removed, no alleviation of pain results; but, on the contrary, it follows that the mechanical support which the sound roots afforded to the remaining teeth having been taken away, a gradual separation of these teeth is permitted, which, admitting of the forcing of portions of food, particularly meat, between them, is the occasion of much increase of annoyance.

It is in these cases, also, that it behooves the dentist to remember that it has sometimes happened that regular dental examinations have been made in consultation, and no cavities of decay nor other tangible evidences of cause for complaint being found, the opinion "no dental complication" has been given, when other and better examinations have subsequently pointed out the locations of irritation, and indicated the means for prompt relief.

I repeat here that the locations in which must be sought this troublesome condition are—1st. The necks of the teeth; which are usually, though not necessarily, more or less denuded; sometimes quite smooth and polished, sometimes slightly soft under the touch of an excavator; usually rather more than naturally different in color (darker) from the enamel, but sometimes not perceptibly so; sometimes unaltered in contour, and in other instances more or less sharply concave, as though worn by the too frequent and prolonged use of the tooth-brush.

That this peculiar appearance is at times due to an abuse in brushing is doubtless true; but that it is also due to irritants which come strictly within the category of *vital* is also undeniable, from the fact that we occasionally meet with some of the most marked illustrations of "notching" at the necks of teeth, in dentures which have *never been brushed*.

2d. In sulci, generally upon the articulating faces of teeth.

When sensitive dentine exists in such sulci as present no visual indications of decay, it is frequently almost impossible to detect its exact location; indeed, it is sometimes only found by actual experiment, first having carefully decided upon the tooth most likely to contain the affected sulcus, and then excavating and filling one after another the various sulci of that tooth, till relief is afforded.

This may seem like very empirical practice; and, fortunately, the requirement does not often occur, but experience proves that the exigencies of certain cases render this procedure one of absolute necessity.

3d. Upon the cusps, cutting edges, and articulating faces of teeth.

These locations are not nearly so difficult of designation as the previously-mentioned positions of sensitive dentine, and yet it will not always be found easy to define them with that accuracy which is needful.

They are found upon teeth which have been worn smooth by attrition during mastication, or have been acted upon in the manner which has been referred to when speaking of notched necks of teeth.

In either case the result of sensitiveness is the same; while, however, the smoothness of attrition, even when the smooth face is undulating, presents a different appearance from the nodulated smoothness of atrophy.

Treatment.—Disregarding for the present the incidental mention of excavating and filling such sulci as were reasonably *supposed* to contain sensitive denture, I shall confine myself to the consideration of such systemic and local applications as have been advantageously employed in combating this condition; premising that systemic treatment is based upon the supposition of existing systemic hyper-acidity, and local treatment upon the knowledge of local acid reaction, and consequent tendency toward disintegration of dentinal tissue.

Recognizing that this sensitive condition in teeth is markedly increased, and even positively provoked, by the free use of such condiments and articles of food as contain large amounts of acid (sour), such, for instance, as pickles, tomatoes, strawberries, apples, peaches, lemons, etc., we naturally forbid indulgence in them for a few days, weeks, or altogether, according to the severity of the case, and find, not infrequently, that even exceeding sensitiveness is rapidly removed.

The administration of *two-grain* doses of bicarbonate of soda in a *tablespoonful of water*, three or five times daily for a week, will be found productive of highly gratifying results.

The tablespoonful of solution of soda should be taken at *one swallow*, in order that we may have the full gastric effect without any gustatory interference; by this method of administration it will be found that even the small doses which I have suggested will be far more efficacious than much larger quantities of soda in two or three swallows of water. It should be mentioned to the patient that the taking of the dose by one swallow insures the absence of taste of the medicine, thus removing all objection to the frequency of its repetition.

In addition to systemic deprivation, and medication, we use locally the mouth-wash of lime-water, and the fine powder of precipitated

chalk, allowing the latter to remain *in small quantity* in the interstices between the teeth.

Also, the mild solution of half a teaspoonful of phénol sodique to a tumbler of water for rinsing the mouth, or for use in brushing the teeth; or, again, the employment, once or twice daily, of some detergent soap (carbolic acid), or some antacid soap, such as "castile."

I have repeatedly had instances in my practice where severe and long-continued "facial neuralgia," with ophthalmic and other serious complications, arising from that systemic condition which finds its local lesion in sensitive dentine, and which had bid defiance to heroic doses of bromide of potassium, quinia, nux vomica, belladonna, strychnia, veratria, etc., yield promptly and completely to the treatment which I have indicated.

(To be continued.)

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Continued from page 518.)

THE SPHENO-MAXILLARY REGION.

THE posterior central portion of the facial region is united to the brain-case through the ethmoido-sphenoidal junction, and the vomero-sphenoidal, the palato-sphenoidal, the maxillo-pterygoid, and the palato-pterygoid sutures. The space between these points of union is a very irregular one, and has been called the sphenomaxillary fossa or space. From a structural point of view, this space is of great importance. In its surgical relations it has little which is not entertained in common with the zygomatic and pterygoid spaces; so that we have thought best to include it within the large irregular area,—the sphenomaxillary region.

This region is imperfectly defined in the skeleton. Its limits cannot be given by means of the hard parts alone. In a general way, it may be said to be that space intervening between the cranium and the face in front, the under surface of the greater wings of the sphenoid bone, the squamous portion of the temporal bone, and the inner aspect of the ascending ramus of the lower jaw, at the side. Within it are received the pterygoid muscles, the trunk of the internal maxillary artery, the maxillary nerves; while it is in relation, externally, with the articulation of the lower jaw.

When the skull is placed upon its side, and the lower jaw is removed, a good view of the superior and anterior surfaces is obtained. We then notice a *superior* surface bounded by the glenoid cavity, the small

portion of the squamous portion in advance of it, the under surface of the great wing of the sphenoid bone. It is crossed from within outward by the squamo-sphenoidal suture. The *anterior* border is the posterior edge of the spheno-maxillary, and the pterygo-maxillary fissure and the corresponding surface to the tuberosity of the superior maxilla. The *posterior* border is the squamo-tympanic suture. The *internal* border is the spheno-tympanic suture, the Eustachian tube, and the outer edge of the scaphoid fossa of the sphenoid bone.

The *external* border is the pterygoid ridge, and a line extending thence backward to the articular eminence and the post-glenoid tubercle.

When the lower jaw and its chief elevator, the temporal muscle, are in position (the way in which the student must in practice restore it), the external surface of the region is incomplete at the sigmoid notch,—a deficiency made good by the masseter muscle lying over its outer side.

The internal surface is complicated by the direction of the internal pterygoid muscle, and the inferior surface answers to the insertion of this muscle.

The spheno-maxillary region yields the orifices of the round, pterygoid, oval, spheno-palatine, and spinous foramina, and the pterygo-maxillary and spheno-maxillary fissures. It communicates with the nose through the spheno-palatine foramen, with the orbit through the spheno-maxillary fissure, and with the temporal fossa.

The region presents for examination three fossæ: the spheno-maxillary, the zygomatic, and the pterygoid.

The first of these—the spheno-maxillary—need alone take our attention here. It is bounded posteriorly by the anterior surface of the root of the great wing of the sphenoid bone, the anterior aspect of the pterygoid process toward its base, and anteriorly, by the orbital process of the palatal bone and the tuberosity of the superior maxilla. It is bounded internally by the vertical plate of the palatal bone, and is conspicuously marked by the spheno-palatine foramen. Externally it communicates with the zygomatic fossa through the pterygo-maxillary fissure; and superiorly, with the orbit through the spheno-maxillary fissure. We have on several occasions mentioned tumors encroaching within the spheno-maxillary fossa, and need not now repeat our observations. For our present purpose it will suffice to mention a very remarkable case recorded by Langenbeck,* of which the following is an abstract:

A boy, aged about fifteen years, suffered at thirteen with occlusion of the left side of the nose. About eighteen months afterward the left cheek and eye began to protrude, and the sight was soon lost.

* For a transcript of Langenbeck's memoir (Deutsche Klinik, 1861), see Med. Times and Gazette, 1861.

No tumor was visible from either nose or mouth, but in the middle of the left palatine process was a soft elastic swelling, and a firm lobulated tumor could be felt in the left choana, with displacement of the septum to the right. An additional mass of small size could be felt externally between the masseter muscle and the upper jaw, causing slight prominence of the left cheek, and fullness in the lower part of the left temporal fossa, and prominence of the left malar bone. Langenbeck diagnosed a fibroid tumor of the spheno-maxillary fossa,* growing inward through the spheno-palatine foramen into the naso-pharynx, extending outward, traversing the entire spheno-maxillary region, and protruding between the tuberosity of the superior maxilla and the masseter muscle. The procedure original with Langenbeck—the osteoplastic operation, which consists in separating the halves of the face, removing the tumor, and restoring the parts to their normal relations—was successfully essayed. The tumor, of the size of a fowl's egg, was found in the locality previously indicated by Langenbeck. The spheno-palatine foramen and the spheno-maxillary fossa were enlarged to three times their normal size.

THE SUPRA-HYOID REGION.

This region, usually placed with the neck, has so many physiological relations with the face,—thus, for example, its muscles affect the position of the lower jaw and tongue,—that it is convenient to include it for the nonce within a group of studies of the facial region. It need be here lightly touched, however, as one in painting a miniature treats details less elaborately the farther he withdraws from the features.

The region before us is in brief the space extending from the hyoid bone to the lower jaw. According to Luschka, its lateral limits between the ends of the greater horns of the hyoid bone and the lower jaw are not vertical but inclined, and answer pretty nearly to the line of the stylo-hyoid muscle. The region is naturally best defined in lean persons, and those with large inferior maxillæ. In the aged the platysma-myoid muscle throws the skin toward the chin into vertical folds, which are often conspicuous. Beneath the skin is a layer of fat, and beneath it in turn is the muscular group, composed as follows:

1st. The anterior belly of the digastric muscle lying upon the mylo-hyoid muscle, and ascending from the dense aponeurotic tissue above the greater cornu toward the chin.

2d. The mylo-hyoid muscles, stretching, in reality as one muscle, from side to side.

* The account in the journal above quoted says *pterygo-palatine fossa*. This we venture to discard. It is included within the spheno-maxillary fossa of our text.

3d. The genio-hyoid, a closely approximated pair of cordiform bundles, passing between the points named.

4th. The genio-hyo-glossus muscles, extending forward from the hyoid bone to the chin, and backward along the entire length of the tongue.

The deep fascia of this space is well defined, and remarkable as it approaches the region of the angle of the jaw for sending a thin layer backward toward the insertion of the internal pterygoid muscle, and which serves to separate the bed of the parotid from that of the submaxillary gland. This partition is pierced by the facial artery, the stylo-glossus muscle, and lower down by the glosso-pharyngeal nerve. In addition to this the fascia nearly envelops the submaxillary gland, and in consequence fixes it, so that enlargements of this body are not mobile, thus distinguishing them from engorged conditions of the submaxillary lymphatic gland which immediately overlies it.

The position of the head will determine the relations of the submaxillary salivary gland. When, for example, the head is erect, the gland is nearly concealed behind the jaw; but when the head is thrown back, the gland assumes cervical relations, and is for the most part superficial.

In our description of the lower jaw it will be remembered that it was stated that the inner side of the horizontal portion below the oblique line belongs to the neck. Now, the gland in question lies below this line, and has all its surgical relations with the neck, affecting the alveolo-lingual groove by pressure from below only.

In the same way the teeth, which at first sight are above the line, and, therefore, oral in their relations, nevertheless affect the relations of the supra-hyoid space by involvements originating above.

It is particularly the molar teeth whose roots may involve this space, since they approach more nearly the inner compact layer of the horizontal portion of the jaw than do the other teeth. Cases are on record in which a periodontitis has excited a secondary (maxillary) periostitis at a point opposite thereto. A striking example of the danger attending the announcement of such a complication will appear in the following history: The case came under our own observation. A young man in whom the roots of a lower wisdom-tooth had been prematurely filled, was attacked with acute periodontitis, ostitis, and maxillary periostitis as above described. This was sufficiently severe to excite inflammation in the loose connective tissue between the mylo-hyoid muscle and the jaw. An abscess followed here, and the pus gravitated to form a collection about the hyoid bone, and from that point passed upward upon the face along the line of the facial artery. The abscess in addition pressed directly upward against the floor of the mouth, and caused

unilateral glossitis, from the mechanical effects of which upon the organs of respiration the patient died. The duration of the extra-maxillary complication was but four days.

(To be continued.)

PRELIMINARY TO FILLING.

BY JAMES E. GARRETSON, M.D.

(Continued from page 418.)

A MOUTH affected with dental caries, and having, at the same time, the gum-tissue chronically inflamed and congested, demands that the first attention be given to the gums.

Passive congestion of the gum-tissue—being of strictly local signification—exists from causes which are remediable, and in a single cause which is without remedy, at least so far as the preservation of the teeth is concerned. The remediable causes are such as have origin in offenses which are found responsive to treatment. The non-remediable cause is that which exists where the density of the dental organs has become such that the teeth are in the condition of foreign bodies, and nature is found exerting herself to throw them off. A cause, the most common perhaps of turgid gums, is seen to lie in the presence of tartar; and this débris, in certain cases, may be so inconsiderable in amount that it may very well be overlooked by the inexperienced.

Other local causes are found in periodontally diseased teeth, in the presence of dead teeth, in an overcrowded arch, in the use of ill-fitting artificial dentures, in the abuse of dentifrices, and in diseases of the underlying osseous structure.

Of causes which affect the gums secondarily, reference is to be made to the mercurial impression, to the venereal disease, to scorbutus, and to carcinoma.

It is a grave mistake to confine the treatment of constitutional diseases to remedies which possess alone local action; such local means are well used, but they are to be employed as adjuncts, and never as specifics. Sordes about the neck of the teeth, as the association of limited and modified scorbutus, is very much more common than is generally supposed; particularly is this found to be the case in communities exclusively agricultural, and in the spring season of the year.

A modified venereal or mercurial impression is more apt to be found the vice of the citizen. It is astonishing how, at times, a chronic mucous congestion which has defied every variety of local application will yield before a few doses of iodide of potassium or potassæ chloras.

Grave mistakes are sometimes made by the inexperienced, in confounding carcinoma with simple ulcerations. An ulcer of a mucous

surface which is cancerous differs from all other kinds, in the giant character of its granulations and in the irregularity of its face and boundaries. It is the very best of practice to apply no irritating character of treatment to a chronic ulcer in the mouth, where the nature of a sore is not fully recognized. Most haste is always made when time is allowed for the examination.

A true carcinoma of the mouth, particularly if the expression be that of infiltration, is to be esteemed incurable: and the much that is commonly done for the purpose of cure has seldom other signification than giving speed to the fatal termination.

The mercurial gums, so common with all that class who use freely of this class of medicines, find speediest cure when, in conjunction with the specific use of the chlorate of potash, free local scarification is employed, conjoined with the daily application of the tincture of iodine, and the employment internally of the vegetable astringents.

A system depressed and broken down, yet being without specific ailment, demands that means be employed which shall, if possible, restore the lost vigor. In this class is embraced a multitude of patients; the teeth decay at every point, yet locally no explanation is to be found, however carefully searched after. A large proportion of the patients of most physicians are to be found of this class. Here it is impossible to do aught than direct attention to those hygienic laws which have more to do with restoring the lost health of such persons than all the medicines that might be prescribed: change in residence, for example; excursions to sea-shore or mountain; attention to sleeping-apartments, to character of food, to dress, to exercise, etc.

In exposing and preparing a cavity of decay preliminary to filling it, it is not alone the ultimatum that plenty of working-space be secured; a matter of greater importance is the manner of getting this space. Young teeth and teeth of loose structure bear wedging and moving much better than they do the free use of the file; old teeth, on the contrary, and dense teeth, are best treated with this instrument. In young teeth, chronic irritability of the pulps almost certainly follows the injudicious use of the file; in old teeth, chronic irritability of the periodontal membrane is quite as apt to associate with the injudicious use of the wedge.

The young practitioner is to be reminded that in caries, when a cavity is found to extend within the margin of the gum-tissue, it is in every case desirable that such preliminary treatment be pursued as shall secure free exposure and uncovering of the hole to be filled; this, experience will teach him, is to be best effected through the instrumentality of plugs of cotton, which are to be allowed to project well beyond the face of the tooth, and which are to be renewed day after day, so that the uplifting of the tissues shall be gradual and without irritation.

A glairy, stringy condition of the mucous secretions, associated with great moisture in the exhalations, are conditions so adverse to the performance of successful dental operations that it is never time lost to stop and first remedy such adverse states. Locally, acids combined with astringents are to be prescribed; internally, few medicines are better than the muriated tincture of iron. As a dentifrice, to be used in such connection, great good is found in the combination of charcoal, orris-root, and Peruvian bark.

Mouths habitually kept foul through carelessness and lack of sensibility on the part of their owners demand the effects of moral prescriptions. There is a class of persons the interspaces of whose teeth are continually found blocked up with remnants from the last meal. These are the mouths in which fungi most luxuriantly flourish, and where, from many causes, tooth-structure has most to contend against. In all cases of this character, the young practitioner consults his reputation when he explains the incompatibility of dental health and such inexcusable filthiness. It is here a wise practice which enjoins the free use of tooth-pick and the after-meal brushing; most particularly is such attention a necessity when the arch is irregular in its arrangement, or when the faces of the teeth abound freely in sulci.

(To be continued.)

PROCEEDINGS OF DENTAL SOCIETIES.

SOUTHERN DENTAL ASSOCIATION.

(Continued from page 546.)

SECOND DAY.—*Evening Session.*

ON motion of Dr. McKellops, one hundred dollars was appropriated from the funds in the treasury to the Barnum testimonial fund.

The subject of "Operative Dentistry" still under discussion.

Dr. Knapp said that he was an old fogey, and operated in the old style. He discards the rubber dam, and does not use machinery, though he does not condemn it, but it should be in careful hands. Uses gold in the form of cylinders. Adhesive gold is not suited for this form; it will clog. Admits that there are many objections to soft gold, but good work may be done with it in almost all operations. Bad work comes from want of care in making cylinders. The length should always be greater than the depth of the cavity. There should be a variety on hand; large ones should be used first, rather soft and easily adapted to the walls; no two large cylinders should be put together next the wall. Several are placed side by side till the cavity is apparently full, and then they are wedged apart and more inserted until no more holes can be pierced. No cylinder should stop short

of the orifice. Each piece extends to, or nearly to, the bottom, and there is no scaling. The projecting gold may be cut into any shape. Cylinders are not adapted to contour filling, but for ordinary work have advantages. They are more quickly introduced. Large cavities can be filled in from ten to twenty minutes, and small ones in five; this obviates the necessity of the rubber dam, which is good in using adhesive gold. Cylinder fillings will receive a high finish. Does not condemn other forms of gold. Uses gold for roots, but does not object to other materials. Makes long tapering cylinders by rolling the gold on a watch-maker's broach, thrusts in the gold, and then a strip of whalebone to condense it sideways, then another cylinder, and so on. Several may be introduced into the front teeth, but not into the molars or bicusps; has used cylinders exclusively since 1851. Williams's cylinders are too loose, and there is not enough variety, and no tapering ones, which are very necessary in compound cavities in turning corners. Success has attended the use of cylinders. Soft gold can be adapted to the walls with less pressure than adhesive. The most adhesive gold he had ever used was made by Leach, of Baltimore, twenty-five years ago.

Dr. Arthur. Adhesive gold has been before the profession eighteen years, and then the property of adhesiveness was not new, but it had not been specially noticed. Leach's gold was refined to the last degree, and therefore adhesive.

The question, What is non-adhesive gold? was addressed to Mr. Pack, who was present. He replied that it was made non-adhesive in different ways by different makers; some oxidize the surface, others produce it by pressure. The principle of annealing gold in the form of plate, etc., is to soften it, but foil when annealed gets hard; he had not been able to arrive at the reasons for this. There is usually something foreign upon the surface or in the composition of soft foil; some of it is only twenty-three carats fine.

Dr. Arthur. Cohesive gold is simply pure gold. He scouted at Fletcher's experiments. Soft gold is alloyed or covered with a foreign substance. Leach, whose foil has been referred to, failed because his gold was pure, and therefore too adhesive; but Abbey and others succeeded because they were able to make a soft foil. Soft foil will be more readily forced against the walls, but a fixed basis will enable you to bring the cohesive into the very closest contact. The idea of failure is absurd. He had repeated Fletcher's experiments with opposite results.

Dr. Morgan. It is a mistake that cylinders are more rapid than adhesive gold; he fills more rapidly than the gentleman who advocated them, and uses mostly cohesive. Had used cylinders some since 1849. Abbey had once exhibited foil which was six per cent. alloy, and

which was very cohesive. Thinks cohesive gold may be adapted as perfectly as non-cohesive ; is gratified to hear of the experiments that have been made. Fletcher's experiments have been repeated in his office with opposite results.

Dr. Walker. Don't think cohesive foil can fail to be adapted to the walls if proper care is used. It is plain that if you begin at the bottom and build up there is a better fit.

Dr. Knapp. More skill is required to use cohesive gold ; time can be saved by using soft ; all will find difficulties ; he has done so, and has seen adhesive foil fail to weld in the hands of good operators. Of two operators of the same skill, one of whom uses cylinders and the other adhesive foil, the one using cylinders will succeed best in saving teeth. Fillings may be too hard, especially in frail teeth. Some teeth poorly filled will last, but it is more owing to the teeth.

Dr. McKellops has used all kinds of gold, and a great many cylinders ; the perfection is adhesive gold ; uses rolled foil and pellets, and every other form of gold. Time lost in making cylinders will nearly suffice to make adhesive fillings. Uses small pointed instruments. No. 30 can be made to fit around a screw, so that a thread will be cut in the gold as if done by a tap. Rolled foil has given him the most satisfaction. Some teeth you cannot fail with, while with others it is impossible to succeed.

Dr. Cobb thinks we have reached an extreme with adhesive gold ; has watched his own and others' failures, and finds them due to cohesive gold. Some of his worst ones have been large restorations. The simplest way is the best, and a large majority of cavities can be filled best with soft foil. Rapid work produces failures. A cork will stop a bottle instantly, but glass requires more work to make it tight. Adhesive gold makes pretty operations, and we admire it and it leads us astray.

Dr. Judd. The paper treats of retrogression rather than progress. Fletcher's experiments did not surprise him ; he (Fletcher) disparages gold and recommends cements and amalgams. He had tried several experiments in the same manner, and had had no failures. Sees hundreds of fillings in a week, and nineteen-twentieths of them are of adhesive gold. If a man is doing guess-work, he will once in awhile make a good filling with soft foil ; but with adhesive he won't do it one time in one million. Dissents from the statement that there is a necessity for drilling holes in the dentine in order to use adhesive gold. Dr. Clark was a first-rate cylinder operator, and his operations did not stand as well as adhesive foil. There is no more, if as much, cutting with cohesive as with soft foil. Cavities can be filled with cohesive foil that cannot with soft. Broad, flat cavities must be cut much more to be filled with soft foil. An assistant is not objectionable.

He would have a lady in his office if he never used a mallet. As to root filling, he is ashamed to controvert the use of such a material as cotton, which some advocate. Gold is not necessarily the best. It is not best rolled on the broach in his hands; uses No. 4 folded square, and cut to make two cones one-quarter of an inch long; carries one to the apex and follows with others. There are a few cases where the shape of the canal will interfere.

Adjourned.

THIRD DAY.—*Morning Session.*

The subject of "Operative Dentistry" was still under discussion.

Dr. Knapp spoke of the newly-invented machinery, and observed that he had noticed that very little time is saved by it; in fact, he had thought that in a clinic this morning an hour was consumed in accomplishing what could have been done in twenty minutes in the old way. Dentists multiply instruments; too many are made, and they are in the way, and half the time is spent in selecting them. Have few instruments, and have them effective. Time is money. A dentist should see all the steps of an operation before he begins it; and cut just where it is needed. In simple crown cavities he would not use more than six instruments,—including pluggers,—and while the machinery is being prepared, he would have the thing done. Protracted operations are unnecessary, except in complicated cases.

Dr. Eames. The science of metallurgy has advanced with other departments. Other metals besides gold possess the adhesive property, —platinum, for instance. Would hardly think any old maker could have made better foil than we have to-day, as has been stated. It is hard to separate other metals from gold. Much depends on the proper purification; the more care is taken, the better the foil. Abbey's has a red color from the iron contained in it,—which destroys the adhesiveness, without rendering it hard, as copper would. Most alloys are harder than the metals composing them; but iron and gold are not so. Rolled foil is softer than beaten.

Dr. Forbes. All metals are crystals; when foil is rolled, the crystals are elongated,—when it is beaten, they are spread laterally. Does the presentation of the crystal edgeways cause the foil to remain soft?

Dr. Walker described his method of filling roots with oxychloride of zinc, using a pellet of gold at the apex, fitted by means of an impression he has taken in paraffine. He finds very little difference in time, whether he uses soft or cohesive foil, in the same operation. Teeth are lost by "2:40 time" operations.

Dr. McKellops. If he can take an impression of the apex, he can fill it with gold. He uses heavy foil, driving in with pieces of whale-bone. Some roots can't be filled; they are fine as hairs, and he wants to see it done. Some of the best men advocate cotton, but he has yet

to see the first successful case,—but has seen root-fillings of gold last eighteen and twenty years. Had heard of the use of oxychloride and creasote for covering pulps, two or three years ago, from Prof. Taft, and since then had been using it.

Dr. King claimed to have discovered the use of it in 1870, while Dr. Taft did not use it till 1872.

Dr. Judd. Capping pulps has been an improvement. We have just as good a record from oxychloride as from oxide of zinc and creasote, and a hundred times as much experience. It makes no cement,—and after the creasote disappears, only a soft substance remains. The failures in using oxychloride are due to an improper manner of using the material; to use it thin, as was formerly directed, was a mistake in theory and practice. He has kept an account, and has had no failures in seven months, and no pain after thirty minutes. Formerly had a good many failures, owing to using too thin. It should be used as thick as possible, and not be employed in unfit cases. If suppurative action has occurred, or the pulp is diseased, he fails. Always precedes with creasote.

Dr. Freeman. If the paste is thick, there will be pressure upon the pulp; if thin, the pulp has a chance to pulsate, and the inflammation will be subdued. With oxide of zinc and creasote the pain ceases immediately.

Dr. Judd. It is unphilosophical to have a soft substance next the pulp; how much pulsation is there, and why did nature not think of it? Don't cap pulps when painful. There is rarely pain if the mixture is dry enough.

Dr. King. The oxide absorbs the excess of chloride, and becomes somewhat hard. He would cap half a dozen aching pulps at once, and would have no pain. Can save pulps by this method that could not be saved otherwise.

Dr. McKellops. At first the practice of using oxychloride looked like perfection; but he is now very sick of it. Nine times out of ten the teeth are devitalized. One or two years is not sufficient to test the matter; by-and-by it will be found to be dead.

Dr. Judd. There should be no free liquid present. There are a great variety of results. He commenced with great misgiving and caution. Had since used it where his judgment was against it, and had got sick of it; and lately had exercised his judgment, and purposely destroyed more pulps; but those he had capped had all done well. If we can save one-half the cases, it is a step forward. It is always time to kill a pulp, but often too late to save.

Dr. Cobb. Care and caution must be used. Time will tell the story. Oxide of zinc and creasote is the best treatment he knows of. It is strange that such an escharotic should preserve the pulp. It is not certain that it will not cause trouble after awhile.

Dr. Johnstone had had experience similar to Drs. Judd and McKellops; has found pulps to be mummified in twenty cases, which he had purposely removed, and had had but two that he was sure were vital. In all these cases the teeth were quiet.

Dr. Freeman. There is no occasion for getting sick of the treatment if this is the result; the pulp dies easy, and becomes mummified.

Dr. King. There are many kinds of creasote. Wood creasote is different from coal-tar creasote or carbolic acid. Many kinds are base in quality, and mainly coal oils, sometimes mixed with alkalies. If they are used, failure is certain,—but with wood creasote success is equally so.

Dr. Chase had used oxychloride for years extensively. Had failed in bad cases, but in selected cases had uniform success. Uses the dam, and applies creasote, and has the paste hard. Leaves six months or a year or more before filling with gold.

Dr. Knapp has been unsuccessful in many cases, but succeeds in others. The different conditions account for this. If the exposure is recent, and there is no inflammation, there is success; but if there is inflammation, the treatment is futile. We should study our cases. Many teeth have been preserved by this means during the last few years. Has pain in nearly every instance, especially if the paste is thin. It is a worthy object to preserve the vitality, but often it is gradually lost.

Dr. Arthur described a method of inserting pivot teeth, which he had practiced for some ten years. The root is filled with Hill's stopping or gutta-percha; a plate tooth is fitted with a gold pin, and is then pressed into the gutta-percha; a forked instrument being heated and applied to the end of the tooth, heats it, and softens the gutta-percha, so that the tooth may be pressed up. He had had teeth manufactured with a platina tube, for the reception of the pivot.

Dr. Morgan thought the method simple, and worthy of trial.

Dr. Knapp said pivot teeth had been neglected because a perfect fit was not made; this method presents advantages, and should be tried.

Dr. Arthur said a tooth so inserted was strong enough to resist the force of biting.

A committee which had been previously appointed to take measures looking to the erection of a suitable monument to Chapin A. Harris was continued, and Dr. Henkels was added to the number.

The meeting then adjourned to accept the invitation of the mayor, who had placed the harbor boat at the disposal of the society, and had invited them to a trip on the river. The excursion consisted of a trip some seven miles down the stream, where the titanic works of the "Vulcan Iron Company" were visited, and the processes of rolling railroad-iron and casting pig-iron from the blast-furnace were witnessed; the boat was then headed up the stream, past the city, under

the great new bridge, the pride and boast of St. Louis, to the water-works some miles above, where the costly and massive as well as beautiful machinery which supplies the city with water was inspected. During the trip a most admirably-served collation, prepared by the St. Louis dentists, was partaken of, and the party returned at dusk, well pleased with the manner in which they had been entertained, both by the municipality and by their professional brethren.

Evening Session.

The secretary read a lengthy paper on "Histology and Microscopy," by Dr. Cutler.

The subject being open,

Dr. Judd said that the origin of secondary dentine is but little understood; it seems to be a taking-up of a long abandoned process,—that is, the dentinal tubuli are extended farther toward the center of the pulp. This is the case in teeth which are worn down. There is a difference between the secondary dentine and that to which it is joined: the former is more translucent. In other forms there are no traces of the tubuli. Specimens are frequently found of its commencing in the central portion of the pulp in sound teeth. These often give rise to most severe neuralgic affections, and are difficult to diagnose. There is hyperæsthesia,—extreme pain from a slight cause. Spoke of a case where there had been constant pain for three years, and the patient had been under treatment for that time,—there were no cavities near the pulp. He finally extracted the first upper molar and found the pulp was almost entirely calcified; the disease was mollified, and he extracted a lower tooth. There were no signs of special defect in these teeth; they were a little more painful when tapped. The symptoms disappeared. Such cases had been saved by opening the cavity and applying arsenic, but in this case the patient would not allow it.

Dr. Knapp spoke of a case of an anterior upper molar which had a small cavity which was filled. He entered the pulp and found a nodule; could not enter the palatine root, as it contained a calcification almost its entire length; subsequently he removed it, and found it hard and dark, and somewhat flexible. Treated and filled, with good results.

Dr. Winder spoke of a case which was difficult of diagnosis: both sorts of growths were found in this tooth; the pulp cavity was divided into two compartments, each of which was filled with loose nodules.

The subject of "Mechanical Dentistry" was then taken up.

Dr. Winder said that celluloid had been more satisfactorily manipulated with glycerin, by Dr. Hunt, of Washington, and also lately with dry heat.

Adjourned.

FOURTH DAY.

The subject of "Mechanical Dentistry" was taken up, and by invitation Mr. Hyatt, Secretary of the Celluloid Manufacturing Co., made a few remarks relative to the improvements in that material and its mode of manipulation. He explained the cause of the defects formerly existing in the plates, which were owing to the fact that the gun-cotton out of which they were made was purchased in the market (being prepared for photographers' use), and was not homogeneous in quality in the same batch, on account of the unequal action of the acid upon the exterior and interior of the bunch of cotton immersed in it, nor uniform as regards different lots. They were now making the material of hemp, which is made into paper, and submitted to the action of acid in that form, thus converting it at once and uniformly into gun-cotton; the steam apparatus and the mode of manipulating it had been improved, and he had yet to hear of want of success where the recent plates were used and the directions strictly followed.

Dr. C. S. Smith gave his experience with the material, which though not extended he regarded as favorable. He had faith in it, and believed it would from present appearances supersede rubber; he had had some failures, owing, however, entirely to his want of experience in using it, and to non-familiarity with the properties of the material, which were different from those of rubber. Care must be used to keep the plate under close pressure after a certain heat, say 230° , was reached, else the camphor would be evaporated, and the result would be a porous plate. There was, in his judgment, little danger of breaking either blocks or cast if due care was used. At the last, the pressure should be about all that can be applied, and the result would be a firm plate of hard texture. The great difficulty was to get enough material at all points, and plates of sufficient size to do this must be used, otherwise there would be defects or sponginess. We should not condemn a thing till we have fairly tried it, as almost anything requires some practice in its use. Even rubber was at first apt to annoy us by being porous or brittle, or we failed to get enough material in the flask. He had subjected a partial set to what he considered a severe test out of the mouth, carrying it in his pocket, and allowing it to lie in the sun, etc., for some two months, and had tried it in the other day, and had found it absolutely without change.

Dr. Johnstone said that his objection to it was, that some plates he had seen turned a dirty sole-leather color. [This was, however, an old plate, and Mr. Hyatt said that none of the recent ones were subject to this defect, also that the camphor taste could be changed by sulphuric acid to one resembling attar of roses.]

Dr. Eames spoke of the former defects and want of success; but he

had tried the improved material and method, and was satisfied with the results so far, but he feared it would hardly hold a single tooth.

Dr. Smith said that a plate tooth could be used very nicely by soldering a backing of gold to it and extending it back into the plate, and it would then be stronger than any rubber plate.

The subject was then passed.

Dr. King read a paper upon the use of the oxide of zinc and creasote as a covering for exposed pulps. The paper was mainly a history of his experiments and discovery of this material, which he claimed to have made use of in advance of all others in 1870. Previous to that time he had used oxychloride, but had had so many failures, mainly in largely exposed pulps, that he considered it very uncertain practice. He claimed, however, uniform success by the use of the oxide of zinc and wood creasote,—not carbolic acid.

The subject of "Dental Education" was then taken up.

Dr. Arthur said that reform in this matter is greatly needed. We have suffered, and unless things are bettered the profession will become degraded by men who are thrust into it by the colleges. He would not denounce the colleges; would give them all the credit that belongs to them, but he knows of graduates who are a disgrace. We can exert a great influence by combination. We must take the colleges as they are, and throw our influence in favor of those who are doing their duty. Men are turned out utterly incompetent; this is not hearsay, but is known by him to be the case. There is now in the city of ——— a man whose name appears as Dr. ———, "dentist and barber," who is a graduate. This is a gross abuse.

The time has come to establish such a college as is needed, if it does not already exist. Irresponsible men should not be allowed to manage these institutions. If students were required to graduate in medicine first it would be better, and the dental curriculum would be simplified, and confined to our specialty. In that way we should be real medical specialists.

Dr. McKellops. We all feel this thing, and feel the want of something better. He does not agree with Dr. Arthur, however, about the value of a medical diploma. Medical colleges are just as ready to graduate incompetent men as dental colleges, and they do it. There is a greater number of incompetent men in the medical profession than in the dental, and they are sent out to trifle with life itself. Chartering colleges to issue diplomas without lectures will not give us standing. Diplomas are sent to Europe, and degrees granted by the bushel. We have power to control this, and let us show our will. Where is there one self-supporting college, and what pay do the professors get, except to have their names and titles paraded before the world? Let the profession show that they have the power, and that we can close up these

institutions. This is the only way to make D.D.S. mean anything. We have the right men, and let us have them in the right places.

Dr. Morgan. Imperfection is written upon everything that comes from the hand of man. We cannot point to any college whose graduates are all qualified. To graduate in medicine is no security; if there are any institutions that have disgraced their calling, they are those of the medical profession. Look at the signs and advertisements of quack doctors,—and they are all M.D.'s. Dental colleges are more faithful than medical. The schools do not belong to the associations, and the associations are not the profession. Ohio has some seventy members in its State society to five hundred dentists in the State; in Tennessee there are two hundred and fifty dentists, and twenty-three members of the State society; and in Illinois, no doubt, the proportion is as small as in Ohio. How are we to get at the matter? The colleges are better than twenty or thirty years ago. Men then went through who were notoriously incompetent. It is true of all the colleges. Support and help them, and don't make war upon them. His alma mater has done some poor work, and he is sorry for it,—but she is his mother, and he will never say aught against her, but will help her by all means in his power. Where shall we drift, with eleven colleges to three hundred and seventy-five students? If we could have fewer of them,—say three,—we could have them endowed. The associations have refused to recognize some colleges; the American Association and the Illinois Society had both repudiated one. The subject is surrounded with difficulty. The standing of men does not depend so much on graduation as was supposed; they stand where they belong in a community.

Dr. Arthur means more than the possession of a medical diploma: he means attending the best medical schools in the country. He desires to relieve dental colleges from attempting to teach branches which they are not well fitted for doing. A man's standing depends on culture, and a better education gives better culture. The standing of the profession is low, and the profession has struggled in vain. Reform is apparently out of our power. Students come to get a degree; and it is said that their demands must be acceded to or the doors of colleges closed. Our influence is admitted, and we can turn our faces sternly against what we know to be dishonorable conduct in colleges. He has no sentimentalities about his alma mater; if his natural mother degraded herself he should prefer her death: so with a college.

Prof. Knapp. There are defects in colleges, both in students and faculties; also in medical colleges. Many go through two courses in them, and can't write three sentences in the English language correctly. But he thinks operations done by dental graduates excel on an average those of non-graduates. There is no harm in giving good men diplomas

without attending lectures. As to ambition to have the title "Prof." printed after their names, it may be true, but in his case it is not; he would resign in favor of any one who would take it, as it is a detriment to his practice and time. There is no greater imperfection in dental than in medical graduates. The New Orleans College had refused to graduate any this season, though one student was his nephew, and one his son,—but they were not prepared for it. They had committed errors at first, but had seen them, and desire a higher standard. Though the colleges do not belong to the associations, yet the latter may do much in recommending students. Hopes he will profit by the mistakes of the past, and make efforts to bring about a better state of things.

Dr. Walker would be glad to see the diploma evidence of ability in either the dental or medical professions. Until legislation is obtained, men will continue to practice what they call dentistry. Would be glad to have every dental student bring a diploma in medicine, but it can't be done yet. But every student should have a good English education. At the end of the course put down the brakes, by putting it out of the power of the faculty to grant degrees.

Dr. Judd. The difficulty is that every man has his own views. It requires concert of action. There is no way except through discussion; until our views are modified by this, we shall have little harmony. Public opinion is the power behind the throne; when the profession says it is a disgrace to enter its ranks without proper preparation, many will be kept out; but the worthy will persevere. We are not alone in having unfit men in our ranks. We must bear the infamy; the community does not discriminate. Any man putting "dentist" on his sign is such in the estimation of the public. We can exert a wonderful influence, and must draw the line of demarkation. We have not concentrated our efforts. The profession, if united, can control public sentiment, as is seen in the abandonment of clasps, and the popular prejudice against them. If we are not medical specialists we are a set of carpenters. Other specialists must be M.D.'s before recognition by the medical profession, and we have been more recognized than any other specialists, and better treated than we deserve. The opposition to teaching the strictly medical branches in medical colleges has passed away. The proper place for the dental education to begin is where the dental and medical branches diverge. No dental colleges have the facilities for teaching the medical branches, but the special application must be taught by dentists. In nine-tenths of the colleges the medical branches are taught by medical men.

Some colleges are exceedingly careless, and the professors incompetent, and the associations should take up the subject and throw their influence against such,—not from hostility, but to force them up. We

don't display enough energy to divert students from them; if we did, we could soon close them up.

Dr. Forbes. How shall we protect the people? Three-fourths of them never ask who is most competent, but who makes the best display and advertisement. They think cheap work the best till trouble ensues. Dr. Parmelee had advised his patients in the public prints against amalgam; can we do anything like that? Might we not simply ask the question, "Where shall I go?" in the papers, and set people to thinking? Can we make men honest in dentistry? There are efficient men who have no principle.

Dr. Judd. So far as money is concerned, we are better off than if no quacks existed. St. Louis was once conservative, but an influx of new people had enabled quacks to get a start, and they (the quacks) were educating the people faster than the profession. It was costing the community too much, however.

Prof. Winder agrees with what has been said; a new school had been started in Baltimore because they were satisfied that something must be done. There were no axes to grind; in fact, one professor offered to give two thousand dollars to be let out. In this school the regents and not the faculty have power to grant diplomas.

The discussions were then closed, and the society went into an election of officers for the ensuing year, with the following result:

President.—Dr. J. R. Walker, of New Orleans.

First Vice-President.—Dr. Isaiah Forbes, St. Louis.

Second Vice-President.—Dr. W. G. Redman, Louisville.

Third Vice-President.—Dr. R. R. Freeman, Nashville.

Corresponding Secretary.—Dr. H. Judd, St. Louis.

Recording Secretary.—Dr. J. F. Thompson, Fredericksburg, Va.

Treasurer.—Dr. J. H. Moore, Richmond.

Executive Committee.—Drs. Arrington, Morgan, Knapp, Henkels, and McKellops.

The society then adjourned.

AMERICAN DENTAL CONVENTION.

(Continued from page 585.)

SECOND DAY.—*Morning Session.*

THE convention was called to order by the president.

The secretary being absent, Dr. Ambler Tees, of Philadelphia, was appointed secretary *pro tem*.

A letter was read from Dr. W. C. Eastlack, of Berlin, Prussia, who had, at the last preceding meeting of the convention, been elected "Foreign Secretary" of the convention ("what that name might imply" was not stated), and accompanying the letter was a paper by Dr.

Eastlack, upon "Dentistry Abroad," which was read, and of which the following is a synopsis:

Dentists at home cannot realize the difficulties attending the conscientious practice of dentistry abroad. Obstinate prejudices against dentistry as a science exist in all parts of the globe. The writer has practiced fifteen years in Hong Kong. There an accomplished blacksmith or barber was considered sufficiently learned to practice all that was needful. No dentist had ever visited this colony, and the field was a battle-field. Some of the English residents actually submitted to the treatment of the heathen charlatans, who might be considered competitors. Prejudices gradually yielded, until now it would be difficult to find a more appreciative community. But, in early days, foolish questions were asked, extraction and pivot-teeth demanded constantly; but saving, and the necessary charges for saving teeth, were greeted with astonishment. The missionary has less difficulty than the dentist; the only natives who were our patients were those who had been in intercourse with Europeans. In Japan, however, they are eager to learn and quick to appreciate; and many of the best families have expressed appreciation of our services.

Berlin is one of the most scientific cities of the world,—the home of intellect and progress; yet dentistry is neither valued, nor, with two or three exceptions, has it a true representative. Amalgam and base materials are used by the pound, and rapidity is the boast, and the accumulation of wealth is the object; better work is declared not to be appreciated, and does not pay.

The patients themselves are duplicates in stupidity to the Celestials; American prices are considered fabulous; the most aristocratic ladies will have rows of teeth shining with amalgam; others will bear the pain of decayed teeth, patiently waiting for the time when they can be filed off and false ones inserted over them. Quacks pamper prejudices and yield to the demand for cheap work. A strong private purse is required to compete with the insignificant prices, though the majority are able to pay. While they send all over the world to obtain impressions of mouths to determine race, in order to discover the "missing link," why do they show such apathy to their own dental structures? It is worth a struggle to be victorious in this branch of science here, where all other knowledge is so profuse.

After the reading of the paper a vote of thanks was tendered to Dr. Eastlack for his communication, and the secretary was directed to apologize for the omission of his name and title of "Foreign Secretary" in the printed list of officers for the last year.

A motion was made that Dr. Eastlack, by virtue of his office, be empowered to use the name of this convention to assist him in organizing societies abroad. Referred to a committee consisting of Drs. Gage, Ambler, and Tees, and the president was afterwards added.

The president, Dr. Allen, stated that there was a very general desire on the part of the members of the convention to hear from Dr. S. S. White in relation to the rubber suits; and as he was present, the convention would be pleased to hear from him at that time.

Dr. White, in response to this request, stated that he had nothing new to communicate. The progress of the case had been duly reported in the *DENTAL COSMOS*. He had done what he could to have illustrated and presented to the court the processes, and the products of those processes, which had been in public use and on sale by the dental profession long prior to the alleged claims of invention put forth by Dr. Cummings, with what result was known to all. As to the future, he had only to say that the Smith case would at the proper time be appealed to the Supreme Court of the United States. (Applause.)

Dr. Roberts, Philadelphia, said that he regretted that the profession had not more generally contributed towards paying the expenses of the suit. He believed no money had been contributed outside of Philadelphia. He thought we should express our interest in the suit in a tangible form.

Dr. White stated that Dr. Roberts was mistaken in his inference that the only assistance that had been rendered came from Philadelphia; several State, local, and district societies had likewise assisted, some of them liberally; although it was true, as Dr. Roberts had stated, that the amount expended had been considerably in excess of that received. He (Dr. White) had retained no money sent to himself towards this object; it had been paid to Dr. Jack, the treasurer of the fund; in one or more cases, money had been sent directly to him (the speaker), but in each instance he had paid it over to Dr. Jack and taken his receipts for it, and it had been credited to the proper parties, and receipts from Dr. Jack sent to them.

Dr. Roberts. Moral aid is very well, but it will not pay a lawyer. The question is, Shall we submit tamely for seven years to this imposition, or shall we make an effort now to be free from it? An appeal must be made to the liberal members of the profession throughout the Union.

Dr. Gage. Are we men enough to give a year's license fee to settle the matter? Each one must take hold of it. If we would not take out licenses we could crush out the monopoly.

The following resolutions were then offered, and carried unanimously :

Resolved, That the American Dental Convention fully appreciates the promptitude shown by Dr. S. S. White in defending the interests of the dental profession in the suits for ascertaining the rights of the profession and the public in regard to the use of vulcanite for dental purposes, and would respectfully request him to continue his valuable aid in carrying the case up to the Supreme Court of the United States, pledging him our moral and material support in defraying the expenses which may be incurred in the future.

Resolved, That this convention recommend to the State and local dental societies the necessity of taking measures to contribute to the donation fund of which Dr. Jack, of Philadelphia, is treasurer, such material aid as they can, to assist in defraying the expenses of appealing the suit of the Dental Vulcanite Company, recently decided, to the Supreme Court of the United States; and also recommend that they discontinue the use of rubber for one year, as our means are being used against us in the prosecution of this suit.

On motion it was ordered that the resolutions be published in all the dental periodicals, and that the local societies referred to accept such publication as official notice of their passage by this body.

The Publication Committee made a report that they had been able to begin the publication of the Transactions on a nearly empty treasury through the liberality of the dealers in dental materials, who had assisted them by advertising in the publication. They had on hand a quantity of the Transactions, which they recommended be sold for the benefit of the treasury.

On motion, the report was accepted and adopted, and the thanks of the convention were tendered to the Publication Committee for the manner in which they had discharged their duties.

Adjourned.

Afternoon Session.

A desultory discussion took place in reference to a proposed dinner at the Grand Union Hotel, but it seemed impossible to unite those present upon any proposition in regard to the matter, and it finally went by default.

The subject of "Incidents of Office Practice" was passed without either a paper or discussion. The subject of the "Relation of Dentistry to Medicine" was treated by Dr. C. P. Fitch, who had written and forwarded a paper on the subject, which was read by Dr. Ambler, and of which the following is a synopsis:

The unfolding of these relations will aid in establishing its status. Dentistry is duplex in character,—generation and conservation of tooth-structure, and substitution of lost organs. The subject is as broad as medicine, as exact as surgery, and as extensive as mechanism. It is the province of the dentist to attend to the observance of those laws which govern the development of the dental organs. The law of natural inheritance is of importance in its relation to the masticatory apparatus. Both paternal and maternal impress influence to some extent the structural quality of the teeth; every practitioner has seen evidence of the workings of this law. This involves the obligation to cease the violation of law in the persons of parents, and to gather up all the elements of a regenerated manhood, that the coming generations may be perfected.

The interference of the dentist is needed to advise correct habits.

Vital and nervous forces influence the production of healthy dental organs, and the dentist must meet the demands for hygienic and restorative measures. Though the arrest of oral diseases is largely mechanical, yet the means are followed by surgical sequences which require surgical as well as medical treatment. Obstetrics is mechanical, yet who would affirm that it is not a branch of medicine? The skill of the finest mechanical expert is necessary in the dentist as well as that of the medical man and surgeon. We demand as a right that our claims be recognized. The dentist should receive an education commensurate with his duties, and pass the curriculum of the first medical schools, as well as possess a special knowledge of the dental specialty.

The reading of this paper was followed by one by Dr. Gage, on "Sixth-year Molars." We give a synopsis, as follows :

Dr. Gage's paper spoke of the diversity of opinion that had existed in reference to the treatment of these teeth, and with good reason. Proper treatment was at the foundation of future comfort. Parents neglect the thing till the case is serious, and possibly until too late. Premature extraction is barbarous and cruel. The patient should come into our hand at an early age. We should consider what course will give the patient the best teeth at thirty or forty years of age. What course will those who condemn extraction at any time recommend when they find the crowns gone at the age of ten? Others always remove. What are young men to infer from these teachings? Avoid either extreme. Use common sense, and pursue a rational course. Clear diagnosis will result in correct treatment. [Models were here shown illustrating the error of removing the sixth-year teeth in the lower arch, while the upper ones are suffered to remain, although this latter arch was much the larger.]

The writer stated that he had had the care of some hundreds of orphan children, who probably would have no future opportunity of availing themselves of dental services. He had in these cases, where a crowded condition was anticipated, extracted the sixth-year molars at the eruption of the second bicuspid, and had been gratified with the results as observed in after-life. He would only commend this practice, however, in similar cases; but where there was probability of proper treatment at a later period, or where there was no pressure evident, he should endeavor to save them. We should press upon the parent the importance of diet; should not yield our ideas of right, but adhere to them, while still making an effort to conciliate prejudices, and show the benefits of the rapid changes and improvements now generally adopted.

After the reading of the paper,

Dr. Fuller said that one was often at a loss how to operate as regards these teeth. They are often too far decayed to save for any length of

time. In such cases he extracts, especially when there is special evidence of injury by retaining ; he gains room thereby for others to come. There are two forms of the arch, regular and angular. In the latter it is no disadvantage to extract the sixth-year molars. It is bad to attempt to preserve when it cannot be done. If lost at last the ossification is more complete, and there is less probability of the space closing up than if extracted at nine or ten years of age. It is our duty to instruct patients, so that many now lost may be saved. He gives rules to his patients so that they may be able to decide what teeth ought to be extracted. We need a popular literature to diffuse information ; all that the people now know is what they get verbally from dentists ; they are frequently surprised to find that the sixth-year molars are "second teeth." Many think it would not be proper to instruct them through the press, but he entertains contrary ideas.

Dr. Gage thought the examples we sometimes see would prove that the members of the profession themselves needed enlightenment.

Dr. Allen agrees with the previous speaker as to the propriety of giving instruction to parents. Few know temporary from permanent teeth ; they suppose all the back teeth are to be shed. He directs parents to keep an eye upon the teeth, and have them filled as soon as decayed. If prematurely extracted there will be contraction caused, and irregularity will result. There is no nation where there are so many contracted jaws and crowded teeth as our own. The clergyman yesterday said there was no mention of dentistry or decayed teeth in the Bible ; this proves that the people of those times had better teeth than now ; if they had had decayed teeth we should have known it. If we wish to preserve and advance our profession, let us guard against the evil that causes the destruction of so many teeth. Other nations keep their teeth till old age ; have well-proportioned jaws, and have room enough in them for their teeth. They have no bolting-cloths, nor any way of throwing out the mineral portion of their food. We refuse to use the materials necessary to make good teeth, and the production is defective. The phosphates and carbonates are placed in the hull of the grain by the Creator ; we are engaged in removing them on a gigantic scale ; there are thirteen thousand mills and eight thousand men engaged in this wicked work, which results in sweeping away twenty millions of human teeth every year. Let us go to the root of the matter. The more he investigates and compares our habits with those of other nations, the more he is satisfied that that is the way to do it. If we want good teeth we must use good materials.

Dr. Fuller. Deterioration of the teeth of females is one of the causes of degeneration. A feeble mother cannot produce a hardy posterity. A healthy woman is the exception ; indeed, it is considered almost unpardonable for a *lady* to be in perfect health. We must adopt habits

that will build up the system. Hereditary disease is generally handed down from parent to child; peculiarities of teeth are also. It is not to be wondered at that we have poor teeth; it is impossible that a poorly-developed woman should bring into the world healthy children. It seems, however, that it is impossible to rectify it, or to change the popular habits.

Dr. Covell. We cannot do as we will: patients won't let us; and we must do the best we can, which is often poorly enough. Never removes sixth-year molars when he can help it, or when it is not absolutely demanded. Has often found the twelfth-year tooth less valuable than the sixth-year. We are martyrs to our manner of living in more ways than one. Europeans come here with good teeth, and are not here long before they have badly-decayed teeth. We have a bad climate, something that acts on this portion of the osseous structure. The remarks made by Dr. Allen will apply also to the bony system. We use too many ices and hot drinks. We all like them. The secretions are vitiated, and act on the teeth as fast as an acid. The Indians have good teeth. The food of civilized life is a hard civilization for teeth. The Bible is not a work on odontology, nor intended to teach science; but the people of Bible times had bad teeth. If we go back beyond the days of Moses we shall find that the mummies of Egypt had teeth filled with gold. There was in those days a distinction made by law between the practitioners of medicine and dentistry. Abuse must pay its penalty, and entail evils upon children. If we could educate society so that females would be healthier, we should do more than we are now doing; but we cannot do it. Many mothers ought never to have a child.

Dr. Allen. Can't is one thing, and don't is another. We cast imputations upon the Creator, and imply that he did not know how to make good teeth. There is a reason for their deterioration. The lower animals live upon plain food. The horse eats hay and oats and keeps in good condition. The endeavor to raise animals in zoological gardens results in the death of ninety-nine out of every hundred born; they do not get sufficient phosphate of lime to unite the maxillary arches, and the result is cleft-palate, which prevents their sucking, and they die of starvation. In the natural state they get abundance of the mineral element. Peasants are compelled to use plain, simple food, and the higher classes suffer with their teeth. Indians have good teeth, when they can't get flour. The materials in proper proportion are provided by the Creator in all parts of the world. Indians have the same climate as we, yet their teeth are good. Nature knew how to make good teeth, and furnished the proper materials. Look at it physiologically and rationally, and the results tally with each other. Every child consumes half a barrel of flour yearly, and is, by its being bolted,

denied twenty pounds of coarse food. It is not so much our habits as lack of material. Nations that don't use bolting-cloths have good teeth.

Dr. Anderson. Does not like the tipping of the twelfth-year molars owing to the extraction of the sixth-year, and has seen many cases where the latter ought to have been there.

Dr. Ambler. Spoke of a case in illustration of the remarks made by Dr. Allen. A lady who had lived on a diet composed exclusively of dainties, biscuits, crackers, and vinegar, had died. Previous to her death she had not sufficient muscular strength to raise her arm ; and the bones were found to be so brittle that they snapped like pipe-stems.

Adjourned.

THIRD DAY.—*Morning Session.*

The hour of meeting having considerably passed without the presence of a sufficient number of members to proceed to business, the president appointed Dr. Covell a committee of one to get in the absentees. He made an effort in that direction, but with little success. When a few members had finally made their appearance, the subject under consideration at the adjournment on the previous day, viz., "Treatment of Sixth-Year Molars," was resumed.

Dr. Lewis said, It is not satisfactory to extract at an early age. From twelve to fifteen years is early enough. If extracted before the second molar makes its appearance, deformity and contraction is the result.

Prof. Coy has operated for twenty years, and watched cases carefully till they came to maturity. In this country of mixed races, children are very apt to have the small jaw of one parent associated with the large teeth of the other. In such a case extraction cannot be avoided, especially if there is lapping of the teeth. When the twelfth-year tooth appears, it is too late for this ; and if the sixth-year molar is then extracted, the twelfth-year tooth pitches forward. If extracted early, a proper development of the dens sapientiae is allowed, and they become good teeth ; otherwise they are lost, and only four molar teeth remain. No one has a right to be dogmatic, as there is a difference of opinion on this subject. If any rule to be invariably followed was to be laid down, he would say, extract ; less mistakes would be made on the whole. We should think carefully before we operate ; simply filling a cavity is not difficult ; but the treatment of the sixth-year teeth is difficult, and he has seen the best operators fail to preserve them. In one case the patient had a bill of one hundred and fifty dollars to pay because they had not been extracted ; the operator had gone on the principle that teeth were made for something, and should be in the place where they grew. There are many things to be taken into the account. Mistakes are fatal.

Dr. Houghton does not believe in indiscriminate extraction. It must be a bad case before he will extract. Does not believe in filling with

gold under twelve years of age ; it is not policy. Uses tin or amalgam. When fissures run across the tooth and the material of the dentine is poor, a composition filling is far superior.

Dr. Covell would not lay down the rule for universal extraction. If there is room enough, would retain the sixth-year molars, and let coming events decide the course to be pursued. We cannot foresee ; and after using all his skill and judgment, he sometimes wishes he had done differently.

Dr. Gage has seen cases of both modes of practice where he had missed it. He instructs parents to bring children early, and shows them the necessity of it. If control of them is once lost, it is lost for a lifetime. Every mouth has its peculiarities. Had extracted, and afterwards found it necessary to take out four more. We should be governed by our best judgment, as though the child were our own.

Dr. Covell. The expansion of the jaw is dependent on the presence and eruption of the teeth.

Prof. Coy. It is conceded that the shaft of bones does not elongate. The jaw grows from the end. Eruption does not elongate the jaw. We measure from the condyle to the symphysis ; the teeth may be swept to one side.

Dr. Covell. There must be an expansion in the body of the jaw. There is pressure from the osseous substance within the jaw ; it forces an expansion.

Dr. Covell then spoke of a case of diseased antrum which he had seen, which finally resulted in the death of the patient. He had not attempted treatment. He also described another case of mucous engorgement of the sinus, which was pronounced by Dr. Willard Parker a scirrhus tumor and incurable. He had extracted a tooth and inserted a probe into the antrum, the withdrawal of which was followed by the discharge of mucus. The protrusion of the cheek, which had been extensive, was reduced one-half before the patient left the office. He was a year in curing it ; used tincture of myrrh and nitrate of silver in weak solution. The floor of the antrum was necrosed. He, however, had succeeded in restoring health, and the patient had reported to Dr. Parker, who was delighted, and acknowledged his mistake.

Dr. Fuller spoke of a case of ordinary antrum disease. He used carbolic acid and glycerin two or three months and effected a cure. Has better results from filling sixth-year molars temporarily where the patient is young and the teeth sensitive.

Dr. Houghton spoke of a case of the eruption of the wisdom-teeth at forty-five. The patient had suffered severely, and was not relieved by the extraction. There was a discharge of blood at the nostrils after extracting, and it continued at intervals, and the patient became bed-ridden. He had opened into the antrum and syringed it, and pus was

discharged from the nostril. He concluded that there must be an opening from the antrum into the nostril, and continued to force out pus, etc. Used solution of carbolic acid and iodine. On the third day there was scarcely a trace of pus,—and on the fifth day no trace. Had treated externally with tincture of aconite and iodine.

Prof. Coy then read a paper upon the "Essentials of True Success in Dentistry." We give a synopsis of this paper, as follows:

Prof. Coy's paper alluded to the progress of dentistry in the past, and considered that its present stand-point was but a dim foreshadowing of its future. He had been led to wonder how success was attained at all in the past. Dentistry, like surgery, started among blacksmiths and barbers; surgery is already perched on the topmost round of the ladder; let dentistry pursue her advantages, and who can name the round that will stop her honorable climbing?

The paper then proceeded to the discussion of the subject; and, in doing so, the following questions would arise: First. What is true success? Second. Who, on entering the profession, can hope to attain success? Third. What is the best means of preparation to lead to success?

It has been said that true success in medicine is to give suffering humanity something valuable. The same rule holds good in dentistry. Harvey, Jenner, and Wells have immortalized themselves; Galileo and Newton will never be forgotten; but others not so distinguished have attained true success,—differing only in degree. He who wastes his time and gives nothing to his race lives the life of a brute. He, then, who devotes his life to furthering his profession, regardless of selfish considerations, is in the road that leads to success. Though he may discover nothing brilliant, it is not his fault; but it is equally honorable to belong to the vast army of honest workers who utilize the new-born fact and develop its greatest good. Dentistry is a grand reception depot, in which all that is valuable is stored away. The operator, the mechanical dentist, and the teacher of dentistry, each swell the stream of knowledge. One man cannot attain true success in all these departments,—life is too short; but as soon as a leading position in a special work is attained, then true success may be claimed to have been reached.

In answer to the question, "Who, on entering the profession, can hope to attain success?" it was stated that honesty, intelligence, application, and adaptability are the qualifications upon which a hope for success rests. But on entering the profession each must choose his sphere, and must have bodily health. For operative dentistry, he should possess a natural manipulative ability,—a hand that can be trained, an accurate eye to guide. These are essential. Dentistry, like surgery, is mechanical, and all eminent in either must be good mechanics.

If the student is to be a teacher, he must be adapted to his calling ; if he is to write forcibly, he must think well, or his time will be wasted. To enable one to succeed, therefore, *adaptability* is necessary.

"What are the best means of preparation?" Under what circumstances can a student be most rapidly and thoroughly educated? Theory and practice are alike necessary ; the combination of these is required. It cannot be obtained in the office of a private preceptor. No individual has time or ability to be a teacher in all the various branches of which a knowledge is required ; if ability was present, who could afford thus to devote his time to students ? or what practitioner would turn over his patients to a student's first operations ? No preparation is better than an improper one. It is absurd and impossible to graduate a man in medicine and then finish him as a dentist in a private office. Medical men are not dentists. Only in a well-regulated dental college can the proper preparation be obtained. In the hospital the medical student gets his best training ; so in the dental infirmary the dental student sees all of dentistry, applies his theory, gathers variety of opinion, experience, and thought. Only in these circumstances can dentistry be properly taught.

A vote of thanks was tendered Prof. Coy for his able and instructive paper.

At this point in the proceedings, Dr. Knowler, of Schoharie C. H., arose and addressed the Chair. His manner as well as his speech indicated that something was coming. He said that he had been selected to perform a duty most gratifying to his feelings, viz., to present to Dr. Ambler a token of the esteem which the members of the convention entertained for him. He referred to the time when they were students together, watching the heated furnace at the midnight hour ; when their preceptor had imported platina from Russia to use in the manufacture of teeth, there not being enough in this country to answer the purpose. Then most of the mineral teeth were imported from France, and resembled the natural organs about as much as a glass bead. Now, instead of importing, we supply the world, and our manufacturers have taken the first premiums at Paris and Vienna.

Dr. Knowler then referred to the efforts of Dr. Ambler in sustaining the convention, and finally begged his acceptance of the watch, chain, and seal which he held in his hand, as evidence of their appreciation of the recipient personally, and of the services he had rendered the convention.

[The gold watch and chain and seal were of most beautiful design and elaborate finish. The case was ornamented with monograms of the American Dental Convention and of the name of the recipient, and the pecuniary value of the gift was evidently very considerable.]

Dr. Ambler appeared dumfounded during the remarks of Dr. Knowler ;

and, on essaying to reply, he found that his emotions had nearly obtained the mastery. For some moments he was unable to reply; but at length he said that, in the language of Clay, "he did not know what he had done that he should have such friends." He had merely acted on the conviction that the convention was a necessity to our existence as a profession, and had done what he could to sustain it. When a thing needed help, he was naturally disposed to assist it. This body was once on the eve of dissolution; the avowed object of some in attendance was to destroy it; but he had felt that there was room for it. He hoped to see many larger meetings than the present one. This body meets a want that no other can; it admits universal representation. He returned heartfelt thanks for the gift, and said he should ever cherish it in memory of the noble-hearted donors.

Dr. Allen, the president, said that to Dr. Ambler was due our presence here to-day; he had resuscitated the convention when it was weak. The American Dental Association, which had been formed from this, had prospered as a delegate body, but it had thrown restrictions around its members, and it was now felt that the friction was a little too great; and that it might wane in the future, while this body would be restored to its former state. He could remember when its meetings convened a larger body of dentists than any other occasion.

Adjourned.

Afternoon Session.

The selection of the next place of meeting and the election of officers was the principal business transacted at this session. The place was fixed at Long Branch, and the time the second Tuesday in August, 1875.

The election of officers resulted as follows:

President.—Prof. B. F. Coy, of Baltimore.

Vice-President.—Dr. R. M. Gage, of New York.

Corresponding Secretary.—Dr. D. Roberts, of Philadelphia.

Recording Secretary.—Dr. A. Tees, of Philadelphia.

Treasurer.—Dr. J. G. Ambler, of New York.

Mr. I. S. Hyatt, Secretary of the Celluloid Manufacturing Company, then made a few remarks upon the nature and mode of manipulation of celluloid.

[As these remarks in substance have already been published in our report of Mr. Hyatt's statements at the Southern Dental Association, published in the COSMOS, we forbear to occupy space by their repetition.]

A paper was then read by Dr. Ambler, entitled "Deeds, not Words." This paper was an essay upon the general subject of the superiority of deeds to words, and was received with interest by the meeting, and the thanks of the convention were tendered to Dr. Ambler for it.

The president-elect assumed the chair, and thanked the convention briefly for the honor conferred.

A resolution of thanks was voted to ex-president Allen for the able manner in which he had performed the duties of his office.

The following committee was appointed, to report at the next convention, in relation to the Barnum dam contribution : Dr. J. Lewis, of Vermont ; Dr. C. Merritt, of New York ; and Dr. A. Tees, of Philadelphia.

A paper by Dr. H. L. Ambler, of Cleveland, on the subject of " Filling Frail Teeth with Gold," was then read. The paper favored the use of soft foil and cylinders next the walls of such teeth.

Dr. J. G. Ambler said that the paper just read was exhaustive, and commends itself to our judgment. He removes all the tooth-substance that will not bear pressure. Had found Pack's pellets admirably adapted to the purpose of packing against frail walls ; they can be carried against the walls perfectly, and pack like Hill's stopping. Heavy gold for frail teeth is unsafe, and productive of bad results in hands which have not had great practice ; the edges would be cracked, and not moisture-proof. He would as soon try to fill an egg-shell with pieces of card-board as to fill frail cavities with Nos. 20, 60, etc., though he was aware that some of the best operators commend it. Abbey's soft foil is admirably adapted for this purpose ; also S. S. White's Globe Soft. With these we can defy frail and delicate walls. Smoothing of the edges is important.

Dr. Roberts fills a great deal with cylinders ; that kind of a filling is continuous from top to bottom, and cannot flake. He does not feel inclined to change his practice, as it has been successful. In bicuspid nothing is so good as to get a firm cylinder next the gum. Condenses with a condensing forceps. Had seen fillings put in by Hudson sixty years ago. There is danger of putting in too hard a filling in soft teeth. Fills temporarily with gutta-percha, and subsequently finds the bone hardened. The pain following the use of osteoplastic is too severe. Extracts first molars in crowded conditions. Cases in which bone is reproduced may result in preserving the life of the pulp, but these are exceptions. Teeth are deteriorating at the present day.

Prof. Coy. If the pulp bleeds, he is satisfied to cap. If you want bone, you must have a coagulum.

Dr. Houghton invariably caps, and saves the pulp. Failures are due to inflammation before capping, or to foreign substances next the pulp. Caps with paper and oxychloride, and does not have one failure in fifty. Great care, however, is necessary.

A paper by Dr. W. G. A. Bonwill, entitled " A Trio of Indispensables," was then read by the secretary.

Evening Session.

Some unimportant routine business, consisting of amendments to the constitution, resolutions of thanks, etc., was transacted, after which a paper by Dr. Geo. A. Mills, entitled "What Next?" was read by the secretary.

This paper referred to the circumstances attending the first introduction and dedication to the profession of the rubber dam by Dr. Clowes, on behalf of Dr. Barnum; to the rapid progress of our art; the introduction of improvements which seem almost to have reached perfection; coupled with an increase in numbers and improvement in quality of our profession; and closed by the assertion that the future was such as we might choose to make it; and that each should labor with renewed zeal for the development of the "What next."

After the reading of this paper the convention adjourned to meet at Long Branch, on the second Tuesday in August, 1875.

AMERICAN DENTAL ASSOCIATION.

(Continued from page 581.)

SECOND DAY.—Morning Session.

THE subject of "Dental Pathology" was still under consideration.

Prof. Taft. Enamel may be diseased accidentally or hereditarily. There is great variety in enamel: some defects are transmitted; others are owing to an interruption of the nutritive process. It is often defective through absence of perfect crystallization; there are defective tracts, —atrophied portions, owing to disease occurring for a time. This is shown by spots of a different color, or grooves or pits, at the points which are forming at the time of the affection. Fissures present openings, especially in molars and on the lingual surfaces of the front teeth. There are defective tracts, beginning internally and extending to the periphery,—or part way. These are different from pits, and are often found on the cusps. How do they occur? By their situation it is rendered impossible that anything should be retained which would cause decay by decomposition. Sometimes there is no organization; the materials are simply thrown together. The fibrillæ sometimes extend into and through the enamel. In one specimen he had examined, the largest number he had ever seen seemed to pass through. We should find out how these phases will modify treatment. We should understand at a view the structure of the teeth. Disease leaves its tracks upon all the tissues, and especially upon the enamel. We should study the character of the tissues, and observe whether they are in their original power. The dentine is not open to observation, but still we may be able to discover something. We cannot understand a portion of a science without

covering the whole ground. Let us criticise as sharply as possible, and see how comes every defect; and endeavor if possible to redeem even those that are hereditary. We must stimulate one another to investigate at home. As regards the parasitic theory, he has not worked himself up to a great amount of interest in it. Because there are living animals in a dead carcass, it does not follow that they were the cause of the death. They play no important part in the decomposition of dentine. Worms and bugs in dead wood are not the cause of its death, but the result. Parasites have no material part in causing decay. The mode of penetration of caries proves nothing as to the agency of these animalculæ. How does it begin? Sometimes it is superficial and is arrested; sometimes largely beneath the enamel; sometimes it penetrates like a shot to the pulp-chamber. These varieties are easily accounted for. The structure between the enamel and dentine varies exceedingly in thickness and character. If it is defective, the decay will extend largely beneath the enamel. But if it is good, the decay will be penetrating. It operates in the direction most easily penetrated. Sometimes the decay-producing agent is concentrated, and most active at one point.

Dr. Spelman. Recent histologists discard the theory of parasites, and substitute that of vegetable or fungous growths. Parasites are found in every species of decay. When decomposition takes place, the open rods are exposed to acids and the leptothrix penetrate; as it progresses, they enter the tubuli and proceed till the pulp is reached. The most natural cause of caries is a growth of vegetable fungus, throwing out spores which articulate with the parent fungus. They develop best in an acid condition. The mouths of the tubuli are enlarged.

Dr. Watt. In regard to the "tooth-edge" business, we overlook the fact that it is not always traumatic; sometimes it exists where there are no natural teeth, and even seems to be located in artificial teeth. This is the same phenomenon as apparent pain in limbs which have been lost. An alkaline wash relieves temporarily. Microscopical examinations do not always reveal the "bugs." White decay is the most penetrating, and it is found in alkaline mouths. Alkalinity in mouths is due to the presence of ammonia; this, in contact with air, is converted into nitric acid, which attacks everything; it has a stronger affinity for lime-salts than for anything else. Ammonia is produced in the breath; it produces spongy gums and soft and porous salivary calculus. Carbonic acid keeps the lime in solution; heat drives off the carbonic acid, and the lime is precipitated. He had been represented as teaching that caries was wholly chemical, in spite of the care he had taken to say that vitality always modifies chemical action. There are four varieties of decay, and many crosses.

Dr. Morgan. Is impressed with the importance of the idea that dis-

ease leaves its impress upon the tissues. Whatever interferes with nutrition impairs the dentine. This shows the importance of the utmost care in respect to the temporary teeth. If they are interfered with so as to arrest the development of the permanent, lasting injury is done.

Prof. Judd. We need something more than we had fifteen or twenty years ago to explain carious action. He has never felt satisfied with any of these theories, but had been in hopes of a better. With regard to the vital theory, one fact is to be considered. Extract a tooth, and reinsert its crown in the mouth, and a carious cavity will occur. He does not deny that the vital force exerts some influence, but in view of the above fact it cannot be the governing principle. The acids of the mouth have a great influence, but carious cavities are not produced by immersing teeth in acids. There is a general effect produced, but no cavities. Is satisfied that *one* agent has been discovered,—the parasite. There are few microscopists in this country capable of examining this subject; but we have the evidence of the best microscopists that parasitic germs exist. How do they act? I cannot tell. Some claim that there is a distention of the dentinal tubuli; this may be; or it may be that they exercise an immediate influence on the soft tissues. Again, it has been surmised that the parasites increase the acidity, and this is a very probable theory.

Dr. Spelman. The acid theory is an accepted one, but does not account for decay. Parasites assist to dilute the fluids, and prevent destruction. Fungous growths prevent motion and dilution. The parasitic theory is being discarded.

Prof. McQuillen was surprised that any one should deny the existence of parasites in carious cavities. He had not only seen them, but watched their movements over and again for hours. As to their causing decay, that is another question. A gentleman claimed last year in the Southern Dental Association to have seen parasites with formidable boring apparatus, by which they worked their way through the enamel and dentine, but we are yet in doubt as to the nature and character of these parasites,—whether they are vegetable or animal. The majority of investigators claim that they are vegetable. Whatever the other causes at work may be, we cannot deny the action of acids in the production of decay. When it is asserted that vitality controls chemical action, it seems to me that those who assert it do not understand what is meant by vitality, or the correlation of chemical and vital force. Instead of chemical affinities being controlled by vitality, there is no vital action possible without the incessant and complicated actions of chemical affinities; all the molecular changes of composition and decomposition occurring in the living body—nutrition, secretion, and motion—depend on chemical actions. Vitality does not prevent the destructive action of an external chemical agent, it only repairs its

ravages. Dip a dead man's finger in nitric, muriatic, or sulphuric acid, and the cuticle will be destroyed never to be replaced; subject the finger of a live man to the same treatment, and the vital action will restore the lost tissue.

Dr. Atkinson. Vitality in its fullest extent includes all other kinds of action. Chemical action is a department of vital action. It is pitiable that men will have the hardihood to open their mouths before this body and not know the thinnest skim-milk significance of the terms they use. One speaker says that parasites have nothing to do with it, and then gives us the description of a parasite. Enamel is one of the differential tissues of the body. The first cell must have been calcified in order to constitute it enamel at all. We cannot transpose the natural serial order. What is the use of talking about dissolving enamel that never existed? When vitality is least, resistance is greatest; and where it is highest there are more doors to let in Peter and Paul and kick up a bobbery in the household. If the elements are perfectly saturated, they are married for life: there is no free love; and if they are not satisfied (as we would say of men and women), you had better look out how you let visitors into the family. You can never get enamel tissue till you have a magma to set it on by the proliferation of the stellate cells that are the base of the rods of enamel. We are mere beginners, and must speak alphabetically. Teeth with more enamel material than is necessary are found to have little pearls at the bifurcation of the roots. People are cultured that are developed in society, and the rule is as good in molecules as in men. When the bonds of affinity are satisfied, we have a permanent tissue. Enamel is an example of crystalline structure; dentine is a compromise. Calling teeth dead is nonsense; they are not dead so long as they hold connection with the system. In teeth out of the mouth, black decay cannot be produced except through a long series of alternating experiments. All decay is effected by solution. Enamel grows upon a basis of dentine, and when full-formed it is next to impossible to affect it in the mouth except by abrasion, because the other tissues will feel the attack so much as to notify the owner.

Prof. Taft. In decay of the teeth, the best organic structure possesses the highest manifestation of vital principle, and in consequence best resists decay. If the life-principle is removed, the tissue disintegrates and falls to pieces. As the life-force is toned up and vigorous, it will resist.

A committee, consisting of Drs. Bogue, Taft, and Shepard, was appointed to prepare resolutions on the death of Prof. Hitchcock.

The report of the Committee on Dental Chemistry was called for, and was read by Prof. H. A. Smith.

The report stated that the year had not been prolific in investigation in this department; but such investigation requires special training,

severe study, means, and leisure, and we congratulate ourselves that so many practical applications of discoveries have been made. Apparently valueless ones should not be judged hastily; they may be of great importance. Practical applications are not generally made by discoverers; witness chloroform, discovered by Liebig in 1834, and applied by Simpson long after, and nitrous oxide, discovered by Davy and applied by Wells to anæsthesia.

The report then alluded to the translation from the French by Prof. Judd of a paper on Dental Tartar, by Dr. Vergne, and commended it as valuable to the student.

Prof. Chase had once read a paper before this body, claiming that human saliva was acid or neutral; but this experimenter stated that it was alkaline, considering that the acidity was the result of admixture with other substances in the mouth. Tartar was then described; its different colors attributed to different agents; and an analysis of it given, from which it appeared that the phosphate of lime is found in much greater quantity in the tartar of the incisor teeth, and the phosphate of iron predominates in the molar. The author concludes that tartar is produced by a change in the gingivo-dental deposit, by which it is decomposed; and that it is formed uniformly upon each tooth, but mechanically collects at two points.

The report then referred to a series of experiments by Dr. G. V. Black, of Illinois, as to the causes of the various colors observed in decay. The fact is noted that all decomposing animal matter is darkened in color. This was stated to be owing to sulphuretted hydrogen, which precipitates any metals present, forming sulphurets, some of which are black and insoluble. That the same causes produce the colors in decayed teeth is highly probable. The decomposing pulp blocks the tubuli, and the sulphurets turn it dark. The sulphurets of iron may be formed from the blood. The experiments to sustain this theory were, in brief, a solution of a tooth in hydrochloric acid, forming a colorless solution; sulphuretted hydrogen gas was then passed through the solution, which changed it to a yellowish color; and the tooth itself (which was immersed) was also changed to a color corresponding to the light yellow of decay. The solution being neutralized by soda, the color grew dark, and finally black, as the reaction became alkaline. By varying these experiments all the colors of decay were produced.

Some further experiments by Dr. Black were described, showing the effects of acids in motion upon the teeth. An apparatus was devised, causing an acid solution to move constantly; two sound teeth placed obliquely in the current were cut gradually away, beginning at the cusps; a groove was also cut between the teeth. On the third day this had extended into the dentine. On the sixth day the crowns were

going to pieces. It was noticeable that the cutting was least upon the surface placed fairly against the current, and most where it broke around the tooth. A tooth immersed in the same solution, but without motion, showed only the usual slight softening. Dr. Black is convinced that this will prove to be the true explanation of decay.

The report then adverted to the action of the coloring matter in vulcanite upon the mouth, and its effects upon the health. There are two opinions: the minority think it highly injurious; while the majority claim that it is inert. Vermilion is six parts of mercury to one of sulphur, and forms thirty-six per cent. of the whole mass of rubber. It is insoluble except in nitro-muriatic acid. The tendency to "flower," or appear in minute globules, may, by the globules being liberated by friction on the plate, and the decomposing action of light, free a small quantity of mercury, which being introduced into the stomach in a finely-divided state might be acted upon by the acids there present, and the active chlorides of the metal produced. Some varieties are adulterated, with arsenic, etc., to which the deleterious effects may be due. In such cases, however, it should be ascertained whether mercury has not recently been taken. It may indeed stay a long time in the system, and then suddenly manifest itself after taking, for example, the iodide of potassium.

The difference of opinion on this subject reflected little credit upon a body claiming to practice on scientific principles. If the compound is injurious, it is our duty to abandon it. The association should institute an investigation.

Dr. Shepard gave notice of an amendment to the constitution, giving the Executive Committee the power to change the place selected for regular meetings for extraordinary reasons. Laid over till next year.

Adjourned.

The afternoon session was dispensed with, to admit of the attendance of the association *en masse* upon an excursion provided by the liberality of the dentists of Detroit. A steamer was chartered for a trip down the Detroit River to Grosse Isle, a journey of an hour or more. At the island, where a retired hotel afforded a quiet and inviting retreat, a collation was served, to which ample justice was done by the party; and in a short time they were again embarked and on the "home stretch." The beautiful scenery along the bank, the enlivening strains discoursed by a fine military band, together with social intercourse, rendered the whole affair an exceedingly enjoyable and pleasant one. A landing being effected, the excursionists marched in procession directly to the hall and at once organized for the

Evening Session.

The subject of "Dental Chemistry" was passed, and "Therapeutics" called, but no member of the committee was present. "Dental Etiology" was then called, and a report read by Dr. M. H. Webb. We give the following synopsis:

Etiology is the science of causes; dental etiology, the causes of processes destructive to the dental tissues. During the formative process, there may be deficient nutrition, or there may be an interruption of nutrition by reason of disease, either of which results in insufficient density or permanent defects of structure. Teeth bear the impress of hereditary disease. The etiology of dental caries embraces imperfect tooth-structure: insufficient calcification of the enamel prisms, incomplete coalescence of the prisms, too great interglobular spaces; and fissures in bicuspid and molars. Certain conditions favor the production of acids as well as of parasites, which Lieber and Rottenstein regard as having much to do with caries. Wedl says it is at least accelerated by them. The former experimenters obtained with dilute acids results identical with those of Westcott, Allport, and others, but did not succeed in imitating caries. Lactic acid is most abundant in the mouth, though various other acids are found. They need not be strong to separate the carbonic acid from the lime. Enamel is normally translucent, dentine opaque; but when attacked by acids, the former becomes opaque while the latter becomes translucent. After the dissolution of enamel, the leptothrix penetrates deeply into the dentine and tubuli, which become enlarged, even in superficial caries; beds of leptothrix are found in uncleansed places. Acids and leptothrix may be reasonably inferred to penetrate the dentine and accelerate disintegration. If caries be superficial, it may be arrested by the removal of the decayed portions, but if the dentine is involved, it cannot be determined when the leptothrix are eradicated,—and if they are not, caries will probably recur; acids favor the proliferation of the parasites. When decomposed material is allowed to remain at the bottom of cavities, the fungi perish or may be destroyed by carbolic acid. When dentine is attacked it is best to excavate and fill, rather than cut away and obliterate the decay. Calcareous deposits sometimes fill the tubuli, known as secondary dentine; Magitot, as well as Lieber and Rottenstein, believed them to spring from the pulp; Mr. Tomes considers it probable that this is deficient in vitality, and this view is favored by its want of sensitiveness. Acids will also attack this, notwithstanding the barriers erected by nature. Polished surfaces are merely the mechanical result of mastication. Salivary calculus causes absorption of the alveoli. The salts of the saliva are precipitated and deposited upon the teeth, and leptothrix, leucocytes, etc., are embodied in masses of this substance. Where it exists, decay is least active, and vice versa. The sublingual secretions

are alkaline, while that of the parotid is acid; when it becomes alkaline, the salts are precipitated. When the secretions are decidedly alkaline, the salts are dissolved instead of precipitated, and caries proceeds with vigor; the pulp is reached, and the whole train of dental diseases—odontalgia, abscess, and sometimes consequent necrosis—ensues.

After the reading of this paper, the subject was deferred till the remaining reports should be read. "Operative Dentistry" was then called for, and a report read by Dr. Shepard.

The report mentioned as among the improvements in this department which had made rapid strides during a year or two past, machinery for operations upon the teeth. It has met a universal want, and though when used without judgment causes the loss of valuable tooth tissue, is yet indispensable. Two things are yet wanting to perfect it, an automatic motor, and a means of stopping and starting the bur suddenly in the mouth. The first is necessary because no nervous force can be spared to drive the machine. Electricity has been tried, and cannot be regarded as a success. Steam has objections, but they may be overcome. The simple idea of its use will tend to prevent its general employment. Several water-motors have been invented, two of which were mentioned as being applicable; also a spring-motor, which is contained in a box a foot square, and can be used anywhere.

The report then alluded to the fact that a few years ago the tendency was to the use of heavy mallets, and that more recently there has been a tendency in the opposite direction, which by some has been carried to the extent of simply rubbing down the foil with the slightest pressure. Ivory points had been recommended, but had not proved a success. Very hard steel points were also recommended, and were claimed to be less dangerous to fragile walls; also a plugger, with a point consisting of a serrated wheel, designed for use after some progress has been made in the filling; this is agreeable to the tired patient and to the tooth sore from malleting. Fisk's saliva ejector was spoken of and recommended. The use of platina foil was mentioned, and recommended for restoring contour, the color being more agreeable than gold. A new preparation of amalgam in pellets was also mentioned favorably.

The report then adverted to the discussion as to the comparative merits of cohesive and non-cohesive foil, and referred to the experiments made by Fletcher, of England. Similar ones made in this country have proved that tight fillings can be made with cohesive gold; poor ones are made with it as well as with all other materials. But have we not used too much cohesive gold to save the largest number of teeth for the largest number of patients? A reaction is sure to come; many of the most active and progressive men have been seeking it out in quiet; and the foil-makers sell more of soft and less of cohesive. Rubber dam and cohesive gold are the greatest discoveries of the century

in our art,—all honor to their discoverers,—no man can do first-class work without these articles. Our meetings, literature, and clinics show how they are appreciated. Of late, however, the question, how best to serve the patient with the least expenditure of time and suffering, is forcing itself forward. The interests of the patient are paramount to those of the profession, and we sometimes lose sight of this and proceed as if he had no rights. Filling teeth is a longer and more painful operation than formerly. Is this necessary to save them? We ought to devise some way in which good, cheap dentistry may be placed within reach of the masses. Every unnecessary moment spent is a fraud upon the patient. The tendency has been to this extreme, and it is high time that some one should champion the sufferers. We have run mad upon cohesive gold, rubber dam, and the mallet, and have abused them shamefully. We are divided into three classes: the enthusiasts, trying all new things, and casting aside the old,—among these are found some of the world's benefactors; the old fogies are at the other extreme; they are safe men, but of little benefit so far as advancement is concerned, and of little influence with the profession. The other class is the mean between these extremes; they investigate, await results, and form the jury whose verdict stands the test of time. The general practitioner should enroll himself among this middle class. Cohesive foil should be used only when it is necessary to have strength. Why put our patients to the expense of time and pain except in these cases? To apply the dam takes time, and is painful; when the tooth can be filled without it its use is injudicious and unkind, and keeps patients away, from their fear of it. The writer uses it less than he did five years ago. It is unnecessary in four-fifths of medium crown cavities, labial cavities in incisors, even under the gum, and in many proximal cavities. Have the crown fillings of ten or twenty years ago failed? Our much-vaunted progress has not been all upward. There are many teeth which a regard for the interests of the patient require to be filled with other material than gold. Tin in crown cavities not having antagonists, as well as in many proximal cavities, is recommended. It is of low conductivity, and is antiseptic. Gutta-percha is a most valuable filling for buccal cavities of molars, and for children's incisors. These two should be used instead of the ton and a half of amalgam now used yearly.

The subject being open,

Dr. Southworth said that the amalgam pellets, as prepared, are extremely dry, and difficulty will be experienced in their use by those accustomed to the ordinary article, which is about half mercury. The pellets have but two-fifths. Where the dam is difficult to apply without using wedges, uses a little toilet soap upon the teeth, and has no further difficulty.

Dr. Crouse takes many exceptions to the report. It accuses opera-

tors using machinery of cutting away too much. This is not generally true; the failure is the other way, according to his observation, even since we have had machinery. The electric machine is a success; has none to sell, but will stand up for it. There might be an improvement, however, in it; and one, as to stopping the bur, has already been made. Agrees with the paper as to the use of soft foil. Never used cohesive universally. If the report means by soft foil partially cohesive foil, will agree with it; this is more easily adapted than very cohesive. For contour fillings, uses Nos. 60, 120, or 20. Hand-pressure should be used more than it is, especially in chalky teeth, which must not be battered at the edges. The report advocates tin foil where there is no antagonist. It takes but little more time or expense to fill with gold; then why not use it? It will be a good thing when we come to the time when we can fill teeth rapidly and well, so as to bring dentistry within the reach of the masses. The dam causes very little pain, takes little time, and is pleasanter than napkins, and you can see your cavity and work with ease and confidence.

Dr. Morgan protests against the use of the terms soft and hard foil, as used. The softest foil is the most adhesive.

Dr. Wetherbee. The report is incomplete, in not mentioning filling roots or removing salivary calculus. He enters his caveat against the statement that labial or buccal cavities can be as well filled without as with the dam. The gum will be wounded and will bleed; the gold is liable to come in contact with it. The patient is not incommoded by thin rubber and fine twine. The majority of patients will prefer a clean piece of rubber to a napkin under the lip. In cavities under the gum an instrument is carried through the hole and below the margin of the cavity, and held by an assistant, and the twine is carried up carefully and tied. You now finish the excavation, and go on with your filling, which can be finished off without lacerating the gum. Some cavities may be filled with pellets without the dam, but they must be small to be successful. Formerly had written against the mallet, unfortunately, but tried it, and found himself not so tired, and not one patient in ten objected. He had dispensed with the light mallet, and used a lead one of five and a half ounces, and found a less number of devitalized teeth giving trouble. He was a convert to the mallet, and rejoiced that it was introduced. For root-filling it has been claimed that oxychloride and Hill's stopping are as good as gold. Few have studied the subject so carefully as to determine this; gold is superior to either under all circumstances. It may be more difficult, but the head and hands should be educated to the task. A professional man should know no defeat where it is possible for intelligence to gain the day. Gold can be carried with certainty where oxychloride, etc., cannot. The subject of salivary calculus has been neglected. We should be diligent in our

search for it. It is doing serious injury, and there are no suitable instruments found among the profession for its thorough removal. We should battle early and long for the faithful removal of this substance, even to the ends of the roots of the molars. Proper instruments can be, and have been, constructed.

Dr. Thomas expressed his approbation in the main of the report. We are really in advance of the past, perhaps, in a hundred-fold ratio. If the report was analyzed, all would agree with it. Has seen the folly of a great deal of this progressive operating. Would not throw a wet blanket upon progression, but we should stop and consider what we are doing. Five years ago would have declared that any man that did not use cohesive foil was behind the age; but when he sees fillings of twenty to forty years' standing still doing well, he stops and considers whether it is justifiable to throw aside all of the old ways and accept all of the new. The middle ground would be more safe. Every one thinks the appliances he has used are the best. It is dangerous ground to denounce old things without a thorough investigation. Agrees with the paper that too much has been cut away; also with Dr. Crouse, when he says that we are at fault in not cutting away enough. We should pursue a happy medium in order to produce the best results.

An informal clinic was appointed for the next morning, with Drs. Webb, Butler, and Ambler as operators.

Adjourned.

(To be continued.)

ILLINOIS STATE DENTAL SOCIETY.

(Continued from page 552.)

FOURTH DAY.

AFTER the transaction of some routine business, the discussion was continued.

Dr. Miles said he believed that there are some cases which demand more separations than others; this depends very much upon the shapes of the teeth. It would be best if proximal fillings could be left so as not to come in contact at all, but if they should come again in contact, the manner in which they are left is of great importance; fillings would be more permanent if less contour and yet not flat. When separations are small, food becomes crowded in; if they are large, we are cognizant of it; separations should be made so as to be self-cleansing. Dr. Arthur says that he is not in favor of indiscriminate filing, yet the adoption of his method would be very detrimental, and especially in country practice, where patients are not so fully under the control of the dentist as they are in the cities.

Dr. Cushing. Under such conditions this would certainly be a very

proper objection. Where we cannot have the proper control of the patients we had better not attempt that system, but that does not prevent our adopting such system with those patients whom we can fully control.

Dr. Townsend. If children's teeth had the same care without the separations, would they not be just as free from decay?

Dr. Cushing. They would of necessity have more care after the operation.

Dr. Low. Arthur's method requires frequent examinations, and more filing each time if decay is progressing. He thought this would have a tendency to make practitioners lazy.

Dr. Townsend indorsed Arthur's method in the treatment of anterior teeth of upper jaw, and was adopting it in his practice, but had less confidence in this treatment with molars and bicuspid.

Dr. Marriner said that with one of his daughters he has pursued as nearly as he is capable Dr. Arthur's method, and with the other has pursued the usual course, and thus far he is pleased with his results in the first case, and expects to be more so in the future.

Dr. G. S. Miles, of Jerseyville, then read an essay on "Dental Legislation," which was not discussed,—as the action by the society upon the report of the Committee on Legislation had already disposed of the matter.

Dr. Marriner, of Ottawa, read an essay on "Popular Education with regard to the Subject of Dentistry," in which he elaborated the necessity of some means being adopted by the profession to educate the public upon the subject of the teeth, as the teeth of many people are often irreparably lost before they ever enter a dental office, owing to their want of knowledge upon the subject.

The subject being open for discussion,

Dr. Cushing said the importance of this subject merits attention. Various ways of instructing the public have been talked about, but only slow progress has been made. The late Dr. Peebles, of St. Louis, suggested the introduction of some short articles upon the teeth into the school-books; such judiciously written articles in the text-books might prove of benefit. If we appear in public prints in this matter we are subject to the implication of being actuated by a desire to personally advertise ourselves, hence this is impracticable. The conductors of the public press are not in sympathy with us as a body, although personally they may feel all right towards us; yet their sympathies are with the scalawags, as they advertise, and the press loses no opportunity to heap ridicule and contumely upon us who stand aloof from these men.

Such articles it would be a very delicate matter to write, and he hardly sees any remedy but simply in exerting our influence to the

fullest extent in our offices, and in the influence exerted by our patients upon their friends.

Dr. F. W. Dean. The Peoria Dental Society has adopted a method by which they expect to accomplish much in this direction. The local papers have agreed to publish an article once a month upon the teeth. The society elects a publication committee, who have charge of the preparation of the articles, to which no names are attached when published.

Dr. Kilbourne. Something ought and can be done in this direction if gentlemen would only lay aside personal jealousies. Theologians send out missionary tracts; why should we deem it below the dignity of our profession to do so?

Dr. K. B. Davis. When the *Dental Mirror* was published, he was often surprised to see the avidity with which patients would seize upon it and peruse its pages, and how little they really knew about the teeth.

Dr. Black has frequently been asked by the professors of educational institutions at this place to give to the pupils a short lecture on the teeth, but has found it very difficult to determine where to commence, where to explain, or where to stop; and the best mode of instructing the public is a rather difficult problem to solve. Very much of this work must be done in our offices, in converse with our patients; and more will be accomplished in this way than is likely to be done in any other.

Upon motion, a committee, consisting of Drs. M. S. Dean, K. B. Davis, and C. S. Smith, was appointed for the purpose of devising the best means of instructing the public; and instructed to report at the next annual meeting.

Dr. Eames having been invited to give his opinion of celluloid as now manufactured, said that he made a thorough test of this base when it was first offered to the profession, and soon after published a report unfavorable to it. He found it unfitted for the purposes of a base on account of its liability to change of form by shrinkage and warping, the great amount of free camphor in some of the material, and the flaky condition of the plates. He believed from what he had learned of the manufacturer of this material that these difficulties in the way of its use had been mainly overcome, and that celluloid as now made was worthy of a trial at least. The reason assigned for the defects in the plates as first made were that they were made from gun-cotton prepared for the use of photographers, that when subjected to the action of the solvent—camphor—a portion of it would be converted into glucose, another portion into celluloid, another portion remaining cotton fiber. These three products, the result of imperfectly-prepared cotton, worked together into a plate, must of necessity give unsatisfactory results. The material is now made from the flax fiber, it being first worked into thin paper, then subjected to the action of acids of

tested strength, and for a given time, which gives uniform results, and this product subjected to the action of camphor gives one result—celluloid. Has used several plates from this new material lately, and thus far is much pleased with them. With the new steam apparatus it is more easily manipulated than rubber. It can be repaired in the same manner as the rubber by moistening the surfaces, when a union of two pieces is desired, with a solution of camphor.

Dr. Black also expressed himself as much pleased with the celluloid as now manufactured, and stated that he had himself made some chemical experiments in the manufacture of celluloid, and that he was satisfied that Dr. Hyatt's explanation as to the cause of the unsatisfactory results of celluloid as formerly made, viz., the imperfect materials, was correct, and that good results would be obtained with the present improved material.

Some miscellaneous business was then transacted, after which the election of officers was held, which resulted as follows:

President.—G. S. Miles, of Jerseyville.

Vice-President.—E. D. Swain, of Chicago.

Secretary.—C. R. E. Koch, of Chicago.

Treasurer.—C. A. Kitchen, of Galva.

Librarian.—F. W. Dean, of Pekin.

Executive Committee.—C. Stoddard Smith, of Springfield, Chairman; J. H. Marriner, of Ottawa; E. S. Hobert, of Ottawa; H. H. Townsend, of Pontiac; A. W. Harlan, of Chicago.

Dr. Miles, the newly-elected president, was then conducted to the chair, and made a brief but very graceful speech.

The society then adjourned to meet at Ottawa on the second Tuesday in May, 1875, at ten o'clock A.M.

THE AMERICAN DENTAL SOCIETY OF EUROPE.

THIS society held its second annual meeting in the beautiful city of Geneva, Switzerland, on the 2d of July, 1874. The society was called to order at ten o'clock A.M., in a fine saloon of the Hôtel de la Paix, by the president, Dr. Terrey, of Zurich. A prayer was offered by the Rev. Dr. Bacon, of America; after which an address was given by the president, as the constitution requires. It was followed by an address of welcome from Dr. Field, of Geneva.

The members present were Drs. Terrey, Zurich; Williams, Geneva; Van Marter, Neufchatel; Wright, Basel; Field, Geneva; and the following new members were admitted: Drs. F. P. Abbot, S. H. Dumont, and J. Raetsch, Berlin; J. B. Wasson, Rome; Henry Shelby, Geneva;

John Crane and Charles Kingsley, Paris; N. B. Gregory, Lyons; J. W. Spear, Berne. Drs. Jenkins and Young, of Dresden, applied by telegram for membership, which was laid over to next session. Other dentists from different cities in Europe appeared before the membership committee, but, according to the constitution, could not legally be admitted to active membership, as this is as far as possible an *American* dental society.

The following subjects for essays and discussions occupied the attention of the society for three days: I. Pivot Teeth. II. Local Peculiarities and Diseases of the Teeth in Different Parts of Europe. III. What does Experience teach to be the Best Material for Filling Teeth? IV. Have Smooth-faced Pluggers any Advantage over Serrated? V. Causes that underlie the Decay and Loss of Teeth. VI. Diseases of the Antrum, and Treatment. VII. Operations hurriedly made and their Opposites. VIII. Difficulties and Compensations of Dentistry compared with other Branches of the Medical Profession.

Essays were read by the following gentlemen: Dr. J. G. Van Marter, on "Pivot Teeth;" Dr. G. W. Field, on "Causes that underlie the Decay and Loss of the Teeth;" Dr. C. M. Wright, on "Local Peculiarities of the Teeth of Europe;" Dr. N. W. Williams, on "Smooth-faced Pluggers;" Dr. J. B. Wasson, on "Diseases of the Antrum;" Dr. Frank Fay, on "Diseases of the Antrum;" Dr. C. M. Wright, on "What does Experience teach to be the Best Material for Filling Teeth?"

The following were elected officers for one year:

President.—Dr. J. G. Van Marter, Neufchatel.

Vice-President.—Dr. G. W. Field, Geneva.

Recording Secretary.—Dr. C. M. Wright, Basel.

Corresponding Secretary.—Dr. C. S. Terrey, Zurich.

Treasurer.—N. W. Williams, Geneva.

Increased interest was displayed by all in the new society, and the fact that the society, originating one year ago in little Switzerland, already brings distinguished members of the profession from the great capitals of Europe, from Berlin, Rome, Paris, and other cities, proves the necessity felt for an American dental society, and augurs well for its future. The discussions were animated and interesting, and the number of the essays offered will compare favorably with any sister society in our much-loved America.

As it is a necessary qualification for membership that the applicant shall be a graduate of an American dental college, and that he shall be proposed by one member and vouched for by two others, before passing the ordeal of the membership committee of three, it may be seen that this society is not so much missionary in its character as some of the societies at home, but a *dental society* that will confer

honor on the member; and though its number may never be very large, its membership will be high and its *code* precise.

The next meeting will be held on the first Monday of August, 1875, in Hamburg, near Frankfort-on-the-Main.

CYRUS M. WRIGHT, *Secretary*.

MISSOURI VALLEY DENTAL ASSOCIATION

Met in annual session at Glenwood, Iowa, July 22d and 23d; President, Dr. Billings, in the chair.

The election of officers for the ensuing year resulted as follows:

President.—Dr. C. Thomas.

Vice-President.—Dr. F. M. Shriver.

Secretary and Treasurer.—Dr. A. S. Billings.

Adjourned to meet in Nebraska City on the fourth Tuesday in July, 1875.

A. S. BILLINGS, *Sec. and Treas.*

TRANSACTIONS OF AMERICAN DENTAL ASSOCIATION.

At the last meeting of the American Dental Association, held at Detroit, Michigan, a resolution was adopted instructing the treasurer to dispose of the back numbers of their Transactions for the cost of mailing and postage. I hereby give notice that the Transactions of 1865 and 1866, one volume, can be had by applying to Dr. L. D. Shepard, Hotel Boylston, Boston, Massachusetts, and sending twenty-five cents.

For 1867 and 1870, of Dr. Wm. H. Goddard, Louisville, Kentucky; the former fifteen cents, the latter ten cents.

For 1868, of A. M. Leslie & Co., St. Louis, Missouri, for fifteen cents.

For 1871 and 1872, one volume, of Dr. M. S. Dean, Chicago, Illinois, for twenty cents.

For 1873, of Dr. M. S. Dean, Chicago, Illinois, with muslin cover and histological illustrations, for one dollar and a half; in paper cover, for fifty cents.

The Transactions of 1869 were consumed in the great conflagration in Chicago.

Persons wishing any of the above will address direct to the parties aforementioned. None will be sent without the amount above specified accompanying the request.

WM. H. GODDARD, *Treasurer*,
No. 65 West Walnut Street, Louisville, Ky.

ERRATA.

WE are desired to correct the following inaccuracies in the report of the proceedings of the first day's session of the American Dental Association, as published in the DENTAL COSMOS for October :

On p. 525 Dr. Atkinson is reported as speaking of the "germ of cell-life;" for germ read *term*.

On p. 529, also, he is made to say that enamel is hypodermal instead of epidermal.

EDITORIAL.

WE continue in this number of the DENTAL COSMOS our reports of the National Associations, concluding the Southern Dental Association and the American Dental Convention.

In the December number we hope to present the third and fourth day's proceedings of the American Dental Association.

The unusual length of these reports has necessarily crowded out original communications and other matter of interest.

BIBLIOGRAPHICAL.

INSTRUCTIONS IN THE MANIPULATION OF HARD RUBBER OR VULCANITE FOR DENTAL PURPOSES. By E. WILDMAN, M.D., D.D.S., Professor of Mechanical Dentistry in the Pennsylvania College of Dental Surgery. Sixth Edition. Philadelphia: Samuel S. White. 1875.

An excellent monograph of sixty pages, containing a concise description of the manipulation of hard rubber as a base for artificial dentures.

The fact that this volume has reached a sixth edition is evidence of its value to those desiring instruction on the subject. The treatise is commended to the profession as embodying all the instructions necessary to the successful employment of vulcanite for dental purposes.

PERISCOPE.

PAROTIDITIS AS A SEQUENCE OF ACUTE DISEASE.—Professor Crocq, of the University of Brussels, has recently read an interesting paper at the Brussels Royal Medical Society (published in their *Journal de Médecin* for January), having for its title "Parotiditis Consecutive to Severe Acute Diseases."

He observes that this is one of the most serious and remarkable complications occurring in certain acute diseases, and especially in typhoid and typhus fevers, scarlatina, cholera, dysentery, measles, and smallpox. It is always to be regarded as a formidable phenomenon,

and is met with at an advanced period of the affection during which it manifests itself. Thus in typhoid it occurs towards the third or fourth week, in scarlatina at the period of desquamation, and in cholera during the stage of reaction. The old writers admitted two forms of parotiditis, which they termed "critical" and "symptomatic," basing the distinction on the theoretical views of disease which then prevailed. A parotiditis was regarded as critical when it appeared towards the end of the disease, not only without impeding its resolution, but even favoring this by inducing a useful revulsive action, and diverting the peccant matter from the nobler internal organs to the salivary gland. When it appeared at an earlier period, and seemed only to add to the violence of the disease, it was termed symptomatic. The former was regarded as favorable, and the latter of unfavorable augury; but no proper character distinguished the one from the other. The view that then prevailed, that the cause of the parotiditis was the determination of the morbid principle to the parotid gland, is still admitted by some under the qualification of the term "metastasis," indicating, however, a purely hypothetical condition. It has also been sought to establish a more rational explanation by attributing the glandular affection to a pyæmic process; but this would only apply at most to a few of the cases. Even in certain cases of typhus and typhoid, which may seem to admit of this interpretation, the parotiditis coexists with no other alteration which can be attributed to pyæmia. It also is far from always going on to a state of suppuration, while this is rarely absent in lesions which are really pyæmic in their nature. Again, in true traumatic pyæmia we do not find any localization effected in the parotid gland, this being one of the organs in which the metastatic abscesses of that affection are most rarely met with.

Numerous observations enable Professor Crocq to establish what he believes to be a truer genesis of the phenomenon. Parotiditis is always accompanied by well-marked stomatitis, characterized by redness, turgescence, and hyper-secretion of the mucous membrane of the mouth. This membrane is covered by deposits of various nature,—mucous, epithelial, fuliginous, lining a more or less extended surface, especially the back of the tongue, and often also the gums, the teeth, the lips, and the inside of the cheeks. This stomatitis is well-marked in typhoid and in exanthematic typhus, occurring especially at an advanced period of the disease, when it is aggravated by the action of the air on the buccal mucous membrane, as the patients generally lie with their mouths open. It is then also that the parotiditis is observed. The same conditions are observed to be present in the cases in which parotiditis supervenes during the stage of reaction in cholera; and in scarlatina and variola, stomatitis is one of their ordinary symptoms. In measles, too, the buccal membrane is often the seat of an eruption resembling that of the skin, and very appreciable, especially about the palate. When in the course of this parotiditis pressure is made on the parotid duct, a drop of pus is observed to issue from its orifice,—a fact which M. Crocq has never found absent. It exists, indeed, from the very first appearance of the complication, when the patient only complains of some pain in the parotid region, or some swelling is observed to exist there; and it is alike observable in the cases which terminate by resolution as in those which go on to suppuration,—proving that this drop of pus does not proceed from suppuration of the gland, since it pre-

cedes and is independent of it. In fact, the stomatitis having reached a certain degree of intensity is propagated along the duct and its ramifications to the substance of the gland. In the same way the submaxillary gland may become affected, and a drop of pus be pressed out from the orifice of Wharton's duct. But this is quite exceptional, the stomatitis at the under surface of the tongue being generally absent or only slight.

This transmission of catarrhal inflammation to the excretory ducts and the glands themselves is no isolated occurrence, being met with in other parts of the body. Thus, the orchitis which succeeds to blennorrhagia is due to the propagation of the inflammation from the urethra by the vas deferens to the epididymis and the testis, this scarcely ever occurring before the fifth week, the epoch at which the irritation has reached the prostatic portion. This affection, exactly like parotiditis, was long regarded as being due to metastasis or to the action of peccant matter. In most cases, also, catarrh of the biliary ducts results from an extension of gastro-duodenal inflammation to the choledochus; and other inflammations may extend to the hepatic parenchyma itself and give rise to hepatitis,—a fact M. Crocq has several times had the opportunity of observing.

Most authors have considered this inflammation of the parotid as originating in the cellular tissue surrounding it, and spreading thence to the glandular substance. Whenever M. Crocq, however, has had the opportunity of examination after death, he has always found the gland itself and its excretory duct the seat of inflammation. It is easy to explain how the error has arisen, as all the phenomena of inflammation—such as redness, exudation, and suppuration—are often much more marked in the interstitial cellular tissue, and they may even extend to the superficial cellular tissue, and there become predominant. This does not imply that the phenomena have originated there, but, as may easily be admitted, that they find there a soil better suited for their evolution. At all events, this is the point now insisted upon: the inflammation, proceeding by Steno's duct, necessarily and primarily invades the proper elements of the gland, which transmit it to the cellular tissue in which they are imbedded.

These considerations lead to the prophylactic and curative treatment of parotiditis consecutive to acute disease. The buccal membrane must be kept carefully cleansed, and all desiccation prevented by means of emollient or slightly astringent applications. As soon as the first symptoms appear, whether these be pain or tumefaction, pressure must be exerted on the gland and its duct, so as to expel from the latter any irritating secretion which it may contain. At the same time leeches may be applied to the swelling, upon which should also be practiced every three hours a mercurial friction, followed by a linseed-meal poultice. By these means resolution may often be obtained.—*Medical Times and Gazette*.

TUMOR OF JAW.—An ulcerating painful tumor of the size of a pigeon's egg, located near the first molar tooth on the alveolar process of the upper jaw, in a woman sixty-five years old. It had grown rapidly during the past two weeks. Three teeth were extracted, and the growth excised.

NECROSIS OF LOWER JAW,—in a boy seven years old, following an

abscess caused by a carious tooth. About one-half of the ramus of the left side was removed through the mouth, after enlarging the fistulous openings.

RANULA,—in a girl eleven years old. The cyst was opened, the fluid evacuated, and the interior cauterized with nitrate of silver.

EPULIS,—recurrent, in a woman twenty-two years old. The growth was of the size of a filbert, and located near the last molar tooth. Encircled by an incision, and removed by bone-forceps.

EPULIS,—recurrent, in a woman thirty-six years old. The tumor was of the size of a large pea, and located near the second molar tooth. Excised.

SUBMAXILLARY TUMOR,—painless, movable, and of four years' duration, in a woman eighteen years old. A curved incision was made in the submaxillary triangle, a flap of skin and fascia reflected, and the growth, which was of the size of an English walnut, excised; it was closely adherent to the submaxillary gland. On section, it presented the appearance of a "mixed cartilaginous" tumor, such as is commonly found in the parotid region.—*Massachusetts General Hospital Reports, in Boston Medical and Surgical Journal.*

DYSPHAGIA CAUSED BY IMPERFECT MASTICATION.—In reference to the very instructive case of Dr. Edis (in the *Journal* for June 13th), in which dyspepsia was caused by imperfect mastication, I would draw attention to the fact that the same condition very frequently leads to functional dysphagia,—that is, to difficult deglutition on account of enervation of the constrictors of the pharynx and œsophagus. It is quite common to see cases where every form of nerve-tonic and of electricity has been tried, where bougies have been passed in the belief that there was a stricture, and where even malignant disease has been not only suspected, but asserted to exist, make a steady recovery after the dentist's aid has been efficiently given. I may, indeed, go so far as to say that I have never seen a case of such dysphagia in which, whatever the assigned cause, the teeth were not more or less at fault; for even if diseased teeth have been removed, and artificial ones substituted, it is not uncommon to find that the "bite" is defective,—that is, that the upper molars do not properly articulate with the lower. It is important to remember, as Dr. Edis has indicated, that in all such cases the general system becomes considerably deranged if the local source of irritation has long existed, and that, while removing the actual cause, it is necessary to treat the effect by suitable medicinal and dietetic measures.—*Lennox Browne, F.R.C.S., in British Medical Journal.*

DYSPEPSIA RELIEVED BY OBVIATING THE CAUSE.—M. G., aged twenty-six, single, was first seen January 7th, 1874. She complained of severe pain in the right hypochondrium and epigastrium, occurring in paroxysms, at times so severe that she hardly knew how to endure herself. It was always worse after eating; in fact, she was afraid to make a meal, lest a paroxysm should be induced. She was troubled much with flatulence. The bowels were very confined. She had passed blood *per rectum* during the last nine months. Her appetite was small and very capricious. The catamenia were regular, but scanty. She was emaciated. The urine was reported to be thick and high-colored. As the majority of the symptoms had existed for many years, and various medicines had been taken with no beneficial result, it was evidently no

ordinary case of dyspepsia. The chest and abdomen were examined carefully, but no trace of disease was detected beyond some slight tenderness over the epigastrium and some slight dullness at the apex of the right lung. On requesting to see the tongue, which was furred, I noticed that the teeth were much decayed; and, on examining these more closely, I found that no two of the molars opposed each other; there was, in fact, no proper masticating surface, and this seemed quite sufficient to account for the symptoms present. The patient was urged at once to see her dentist, and have the defect remedied. In the mean time, some pepsin wine, with tincture of capsicum and dilute nitric acid, was ordered, and extreme carefulness in diet enjoined. Artificial teeth were inserted in due time, and since then the patient has had no return of her former symptoms. She is now stouter and much healthier in appearance; the bowels are more regular; there has been no recurrence of the hemorrhage, and the condition generally is one of most marked improvement. She says herself "she has never felt so well in her life; nothing ails her now; she can eat and drink anything."

I have thought the case worthy of record, for I have met with many others where the Pharmacopœia has been exhausted in vain,—the cause of the malady having never been detected, or even suspected. The narration of this may serve to put others on their guard in dealing with these tedious and troublesome cases.—*Arthur W. Edis, M.D., in British Medical Journal.*

TOPICAL APPLICATION IN PAINFUL DENTITION.—

R.—Syrup of tamarinds, ℥iiss;
 Infusion of saffron, ℥ii;
 Honey, ℥iiss;
 Tinct. (essence) of vanilla, gtt. iv. M.

Rub gently over the gums with the finger or rag. An application of a similar character is the following:

R.—Saffron (powdered), 4 to 6 grs.;
 Honey, 2 to 3 drachms.

Glycerin may be substituted for the honey.—*Philadelphia Medical Times.*

TOOTHACHE DROPS.—

1. R.—Chloroform,
 Sydenham's laudanum, āā ℥ii;
 Tinct. benzoin, ℥viii.
2. R.—Creasote,
 Chloroform, āā ℥ii;
 Sydenham's laudanum, ℥iv;
 Tinct. benzoin, ℥i.
3. R.—Oil of peppermint,
 Rhigolene,
 Chloroform, āā ℥iii;
 Camphor, ℥ii.
4. R.—Chloral,
 Camphor, āā ℥i;
 Morphia, gr. ii;
 Oil of peppermint, ℥ii.

THE DENTAL COSMOS.

VOL. XVI. PHILADELPHIA, DECEMBER, 1874.

No. 12.

ORIGINAL COMMUNICATIONS.

THE FACIAL REGION.

BY HARRISON ALLEN, M.D.,

PROFESSOR OF ANATOMY AND SURGERY IN THE PHILADELPHIA DENTAL COLLEGE.

(Concluded from page 570.)

THE NOMENCLATURE OF THE TEETH.

WE propose as a concluding theme to invite attention to the arrangement of the cusps of the teeth, and hope thereby to correct what we believe to be erroneous opinions hitherto held respecting them. So far as we know, the method suggested by the principles of evolution has never been applied to the study of teeth in a single dental formula. It is probably owing to this fact that the value of observations upon the variations of the tooth-form has been underrated.

We have thought it best to first state our impressions in the shape of propositions, and after so doing describe briefly a few examples of teeth illustrating them.

(1) Since the cusps exist before the roots, the latter may be said to be conformed to the cusps. So that to every cusp there is a tendency to form a distinct root. It is best, therefore, to study teeth by their cusps.

(2) A tendency exists in all cusps to assume the conical form, which is modified by the presence of one or more rounded eminences,—generally from the palatal surface near the neck. These may be inconspicuous, of moderate size, or pronounced. The inflections between the conical crown and the eminence just named are sufficient to describe every possible modification of form.

(3) Since in the carnivorous and insectivorous quadrupeds we often have present a ridge-like form below the cutting surface called the *cingulum*, we are led to accept the eminence in question as having the

same value in kind with it, but exhibited as a rudiment, and would propose for it the term *cingule*.

(4) Thus prepared, we would say, in applying in practice the above proposition, that an incisor and a canine tooth are composed respectively of one cusp and a small cingule; that a bicuspid is composed of a cusp and a large cingule, which participates in forming the triturating surface; that a molar is composed of three cusps and a cingule, which in the lower teeth becomes co-equal to the cusps, but in the upper is smaller, and is imperfectly used in grinding.

(5) That a true development occurs from the canine and incisor series toward the molar, by means of which the cingule of the canine becomes the cusp of the bicuspid; that should a new cingule be developed from the bicuspid it becomes in the molar the third cusp; and that should the molar possess more than four tubercles, three of them will be cusps, the remainder will be cingules.

(6) The peculiarities of the wisdom-teeth are best explained by the multiplication of cingules with corresponding repression of the cusps (notably the antero-internal), or by reversion of the molar to that of the bicuspidate type. In the first group (seen oftenest in the lower jaw) we place those examples of multicuspitate teeth, and in the other, those with diminutive crowns (seen oftenest in the upper jaw), which present cusps as in a bicuspid tooth, with, it may be, an additional cingule.

(7) In describing a normal upper bicuspid we would state that its single buccal cusp is the "canine" cusp, and its palatal its true "bicuspid" cusp (*i.e.* the cusp which creates a bicuspid tooth out of a canine). In a normal upper molar its antero-buccal cusp is the "canine"; the antero-palatal its "bicuspid"; the postero-buccal its true "molar" cusp; and the so-called postero-palatal is but a cingule. In a lower bicuspid the relations are the same as in the upper tooth. But the lower molar differs from the upper in the possession of a cusp in the place of the cingule. So that the upper molar has three cusps and a cingule, while the lower has four true cusps.

(8) It will follow from the foregoing that the lower molar is more highly developed than the upper; that the simplest expression of a cone is exhibited in the incisors and canines, which may be said to be the lowest of the series; and that the highest expression anywhere seen is in the lower formula,—say the second molar, since here no tendency to reversion to the "bicuspid" type is seen.

(9) The above propositions may prove of value in studying deformations and in establishing a law of dental variation.

With these remarks we will content ourselves in naming the parts as they are exhibited in the following figures:

Throughout, c = "cuspid" cusp; b = "bicuspid" cusp; m = "molar" cusp; cg = cingule.

Fig. 36 (No. 64, Morton Coll.* The upper incisors and left canine). These teeth show well-developed cingules, somewhat trifoliated. We may here remark that the tendency to a trilobed appearance of both cusps and cingules is often very marked.

FIG. 36.

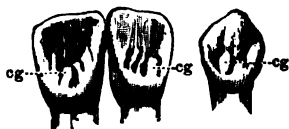


Fig. 37 (No. 1327, M. C. Right upper). A series from the skull of an Australian, which is remarkable for possessing four molar teeth. The first bicuspid presents a cingule. Each of the molars exhibits a cingule except the last, which is seen to revert to a bicuspidate type, and to closely resemble the first bicuspid.

FIG. 37.

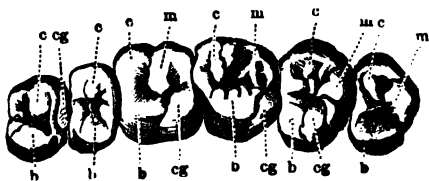


FIG. 38.



FIG. 39.



FIG. 40.



FIG. 41.



FIG. 42.



Fig. 38. This is the second molar of the above series seen in profile, showing that the "molar" cusp may be also shorter than the "canine" cusp.

Fig. 39 (No. 1342, M. C. First and second left upper molars). The first tooth here exhibits a cingule upon the bicuspid cusp, in addition to the one commonly seen on the palatal surface.

Fig. 40 (No. 133, M. C. Third molar, left upper). A good example of reversion of a wisdom-tooth to a tricuspidate type.

Fig. 41 (No. 64, M. C. Left upper molar). The enfolding trilobed appearance in each of the cusps and cingules is unusually pronounced.

Fig. 42 (No. 1328, M. C. First molar, upper, left). A remarkable example, in which, in addition to the arrangement above given, a large cingule is developed upon the palatal surface of the "bicuspid" cusp.

FIG. 43.



Fig. 43 (No. 55, M. C. Third molar, upper, left). This tooth

* The abbreviation M. C. will indicate that the number so distinguished answers to a specimen in the Morton Collection in the museum of the Academy of Natural Sciences of Philadelphia.

shows an elongation forward and outward,* chiefly due to the change in shape of the "canine" cusp.

FIG. 44.



Fig. 44 (No. 1327, M. C. Left lower). This series exhibits a cingule upon the palatal surface of the first molar, which is not repeated in the other molars.

FIG. 45.



Fig. 45 (No. 1342, M. C. Right lower). A series somewhat similar to the preceding, showing in the third molar two distinct molar cusps and a cingule. In this tooth the posterior roots were divergent and distinct, and suggesting a positive relation between the development of the cusps and the juxtaposed roots.

FIG. 46.



FIG. 47.

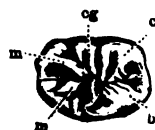


FIG. 48.

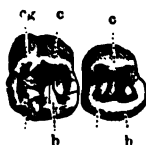


FIG. 49.



Fig. 46 (No. 1343, M. C. Third lower molar, left). This tooth shows unusual development of the enamel foldings.

Fig. 47 (No. 64, M. C. Third molar, left lower). This tooth shows a well-marked cingule. All the teeth of the series exhibit the same peculiarity. The several cusps are markedly trilobed.

Fig. 48 (No. 1467, M. C. First and second deciduous molar, upper, left side). The first molar is the common form of a deciduous tooth. It is to be observed that the canine and molar cusps have united. In the second molar the form is different, for here a well-defined sulcus exists between the canine and the molar cusps. A good example of a cingule lies toward the palatal side. The second molar is thus seen to

* The "canine" cusp in this figure is not indicated by the letter c as in the others.

closely resemble a permanent molar, while the first molar bears an intimate resemblance to a permanent bicuspid.

Fig. 49 (No. 760, M. C. First upper, left, deciduous). In this tooth the bicuspid cusp is separated from the canine cusp by a sulcus, and a cingule is present upon the latter. Thus the first molar of this series more closely resembles a molar of the permanent set than the corresponding tooth in Fig. 48, which recalls the form of the permanent bicuspid.

In the event of the first deciduous lower molar being found with but two roots, we would expect its crown to correspond with the outline of Fig. 48 rather than the one in Fig. 49.

Fig. 50 (No. 140, M. C. First and second left upper molars, deciduous). The first tooth here exhibits less enfolding about the "cuspid" and "molar" cusps than is ordinarily seen; and the second molar shows a tendency to duplication of the cingule.

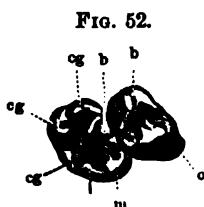
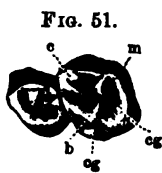


Fig. 51 (No. 828, M. C. First and second molars, upper, left, deciduous). The second molar exhibits a second cingule upon the palatal aspect of the bicuspid cusp.

Fig. 52 (No. 1488, M. C. First and second molar, upper, left, deciduous). These are remarkable tooth-forms. In the first molar tooth, the "molar" cusp of the permanent molar type is present here in the deciduous tooth as a minute cingule. In the second, the cingules are three in number, and have crowded in the "bicuspid" cusp, so that this prominence is no longer a participant of the surface toward the palate. (This figure has been carelessly cut. In the original the fact as above described is more evident.)

Fig. 53 (No. 29, M. C. The first molar, right upper deciduous). This figure is designed to show the marked development of the enamel prominence characteristic of the buccal face of this cusp. It should not be confounded with a cingule.

Fig. 54 (No 1466, M. C. First and second deciduous molars, lower, left). The first molar exhibits a feature often seen, namely, the prolongation inward from the "cuspid" cusp as a thin enamel fold, which constitutes the anterior border of the grinding surface. The bicuspid cusp is partially inclosed by this fold. A little triangular pocket is by this arrangement left between the enamel fold and the bicuspid cusp.

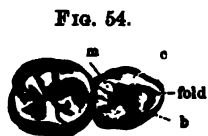
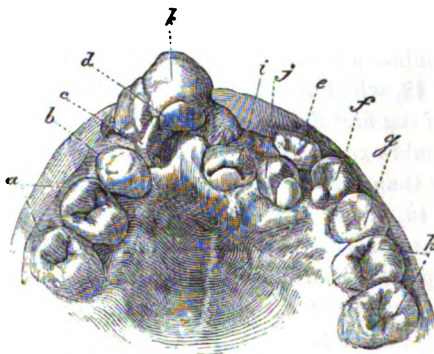


Fig. 55 is taken from a plaster cast of the hard palate with the dental arch, secured from the mouth of a young girl, the subject of nævus of

FIG. 55.



a, r. bicuspid; *b*, r. canine; *c*, r. lateral incisor; *d*, r. central incisor; *e*, l. central incisor; *f*, l. lateral; *g*, l. canine; *h*, l. bicuspid; *i, j*, supernumerary teeth; *k*, nævus.

the gum, operated upon at the clinic of the Philadelphia Dental College, in August, 1874.

The teeth marked *f, i, j*, were extracted, and are figured separately in Fig. 56. It will be observed that all three of these teeth are of the incisor

FIG. 56.



a, the lateral incisor; *b, c*, supernumerary teeth; marked in Fig. 20 *f, i, j*.

group,—that is to say, they are developed from the incisorial portion of the maxilla. It is of interest to observe that the deformation in each case is the same, namely, an exaggeration of the cingule. In the lateral incisor it is conspicuous, but in the supernumerary teeth the cingule in each is so large that at first sight these teeth would be taken for bicuspid. Indeed, they are such, in a morphic sense, if we accept the fifth proposition as above defined. But since they are confined within the space of the inter-maxilla, we prefer designating them as deformed incisors.

We desire to mention yet another point before leaving this subject. It will have been observed in the upper permanent teeth and the second deciduous molars, both above and below, and to a less constant

degree in other teeth of the molar series, that the "bicuspid" cusp tends to extend obliquely across the tooth to join a corresponding prolongation of the "molar." This forms a ridge, which is very characteristic of the human molar tooth within the range above mentioned. It is not a little singular that this evident arrangement should have so long escaped notice. Professor Owen, in his "Odontography," and Mivart, in his "Elements of Anatomy," are the only systematic writers who mention it. So far as we have learned, but little attention has been directed to it in teaching.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the Office of the Librarian of Congress at Washington.]

(Continued from page 566.)

2d. Sensitive dentine found in connection with superficial caries.

SUPERFICIAL CARIES is that form of dental decay which admits of advantageous removal by files, chisels, or disks.

Comparatively little need be said upon this link of our material, from the fact that the systemic and continuous local treatment of this condition is that of sensitive dentine without cavities of decay, while the topical treatment from the dentist will be found to be more than sufficiently discussed for this purpose, in the necessary minutiae pertaining to this subject in its relation to simple caries.

It is nevertheless proper that this view should be presented, lest doubts as to its recognition might arise in the mind of the student, and fears be begotten that something, possibly of importance, had been overlooked.

It will readily be appreciated that it is not within my province to enter with any degree of fullness into the considerations which belong to operative dentistry, and I can therefore contrast but lightly the merits of the various modes of manipulation *for the removal of superficial caries*; but from the pathological standpoint I deem it my duty to counsel moderation and much reflection before indulgence in any performance of this operation.

It is a question of primary importance, as to whether the removal of an amount of tooth-tissue sufficient to obliterate all *perceptible* evidences of decay, will be productive of any permanent benefit, even presupposing that the operation is performed in the most approved manner, —that it has been done with the least possible discomfort to the patient,

the least possible mechanical irritation to the tooth, and that the best possible contour for future preservation of the tooth has been given, through the establishment of a nicely polished, self-cleansing surface.

Some dentists claim that observation and experience have given them the capability of making this prognosis with comparative certainty, but it surely behooves the majority of practitioners (especially during the earlier years of practice) to bestow marked attention to such teeth as have been treated in this manner.

It has been my experience, moreover, that the incisors and cuspids, superior and inferior, have more frequently rewarded my labors in this direction than have the bicuspid and molars, which, possibly, may have resulted from the greater facility with which such surfaces as I have indicated can be made upon the former teeth, without the concomitance of other disagreeable associations.

This last consideration forces upon us the recognition that a possibility exists which renders even the establishment of non-decaying surfaces a questionable benefit.

This is certainly sometimes the case; it may be rarely so in the anterior teeth, but even in these it sometimes results in a very uncomfortable denture; while in the posterior teeth it not unfrequently, slowly but surely, so changes the direction of force during mastication, as eventually to alter the normal articulation of the teeth, and cause such separation between them as to permit the painful insinuation of food at every meal.

Again and again I have heard patients express most feelingly their regret at this separation of their teeth, and assert that if it was done because fillings between the teeth were more liable to fail if introduced without this additional precaution, it would, in their opinion, be far better to have the fillings renewed every few years, and enjoy a life of comfort in eating.

This view is certainly entitled to much consideration in weighing the advantages and disadvantages of any work which *once done cannot be undone*, but must remain "for better or for worse" during the maintenance of the teeth, or entail, for the purpose of "restoration," a long series of tedious and very expensive filling operations.

If, then, these objections exist in cases which admit of comfortable performance of the separation and the successful result of permanent arrestation of decay, how carefully should be considered the advisability of its performance in cases where exceeding tendency to decay, *at least of dentine*, is indicated by the combined *softening and sensitizing* of that tissue.

It is with much hesitation that I offer opinions just in this connection, for it is urged by some of the best members of our profession that this is the *very* class of teeth which should most positively and unhesi-

tatingly be treated by the operation of separation for the removal of superficial caries.

Twenty years ago, I felt sufficiently impressed with this conviction to trust much to the half-round file, the chisel, the chalk, and the lime-water; in this conviction I was oftentimes sustained by the results of those who had filed in the mouths of the elder of my patients twenty years before; but as year after year gave me their additional testimony, I became more and more cautious in this matter of "free separation," and particularly in regard to the soft, sensitive, prone-to-decay teeth for which it has been so strenuously advocated.

I found that patients would tire after a while of constant attention to exhaustive cleanliness and strict remembrance of the use of prophylactics, and that, despite my evidently perfect self-cleansing surfaces, sensitiveness and decay would again present, in such extent of location, as to preclude the idea of further relief by simple removal of more tooth-substance, and compel attention to the thought of the introduction of fillings, and that, too, in the near future.

Thus it was that in such cases, thereafter, I came to see my continuance of failures in attempts at saving these teeth by fillings; many failures, which made me join with others, most heartily, in detestation of the "vulnerable spot" near the cervical edge of the fillings.

Thus again it was that tin foil, from its apparent (perhaps real) ease of adaptability to the walls of such cavities in such teeth, came to be regarded, by many, as better than gold, and this gave birth to the ideal possibility of a material which should possess some quality *other* (not beyond or greater in the aggregate),—but *other* than was possessed by gold with all its pre-eminently valuable qualifications for the purpose of filling teeth.

Then gutta-percha was presented to the notice of the profession, with claims, based upon some experimental use of the article, that, "although it should not supersede gold," it could yet be substituted for gold, *most advantageously*, in the very instances where gold in the hands of the most skillful operators signally failed.

In the midst of much experiment, in despite of the failure of many compounds of this material, in defiance of doubt, ridicule, and prejudice, and notwithstanding the almost entirely improper method of manipulating the article, it has gradually grown in favor, for "truth is mighty and will prevail."

In the proper place, I shall have to discuss the pathological and therapeutic considerations which pertain to gutta-percha as a material for filling teeth; I shall therefore only say, at present, that I have been systematically experimenting with this material, crude and compound, brown, red, and white, for eighteen years; that I have thus far decided that *selected sheets* of the ordinary red "base plate" (selected for its

toughness, as tested by bending backwards and forwards many times without breaking), has proven the most serviceable; that the teeth in which its employment is especially indicated are those possessing soft dentine with fair quality of enamel; that the cavities whose indications are most markedly met are those *decidedly* between teeth having the enamel of the articulating face or cutting edge unbroken (to prevent abrasion of the gutta-percha), and possessed of reasonable strength, and those which are located on the *buccal faces of molars and bicuspid*s (especially molars), *at the necks of these teeth and extending under the gums.*

Gutta-percha has been almost always referred to as a material for "temporary fillings," and its value for this purpose is universally conceded; but *permanence* in this matter refers to ability for prolonged protection of the tooth, and in these particular cases the idea of applying the term "permanent" to a gold filling is as absurd as it is unjust to apply the term "temporary" to an equally well-introduced filling of gutta-percha.

My experience is that *in such cavities in such teeth*, gutta-percha fillings will far exceed in permanency the best gold work.

In the recollection that these cavities are almost invariably found containing sensitive dentine, we are naturally brought to the discussion of the

3d division of this subject, entailing upon us considerations pertaining to simple caries.

SIMPLE CARIES is that stage of progress at which decay has produced a cavity which requires in its treatment the use of some material as a filling.

Dental decay, coming within the classification of simple caries, having been found, the first step toward its treatment is termed the *preparation* of the cavity.

This consists of the complete excavation or removal of the diseased dentine, together with the proper smoothing of the edges.

This operation is done by means of the appropriate chisels, files, hatchet and hoe excavators, burs, etc.; and *thoroughness* is just in proportion to the perfection of cleanliness, smoothness, and neatness of preparation, together with the propriety of shape given the cavity.

It is, as I have said, in the very commencement of this preparation, that the first obstacle to comfortable operating presents itself, forcing us, in greater or less degree, to resort to the employment of some one or more of the various methods for the removal of the tenderness.

I desire, as a preliminary, to impress the importance of so arranging mouth napkins, or rubber dam, as to secure the most complete *dryness* possible, for this procedure alone will frequently so decidedly obtund sensation as to admit of comparatively easy progress. .

We have, in this, another evidence of the plausibility of the theory that sensation, like heat and light, is but a mode of motion, which motion is facilitated by the presence of moisture (humidity), and interfered with by its absence (dryness).

We have also the familiar illustrations of the moistening of the tips of the fingers and of the tongue, to render acute the senses of touch and of taste, and we argue inversely that if moisture thus increases sensibility, dryness would, in proportion to its completeness, obtund it.

Although this fact was admitted during the days of dependence upon napkin-drying, yet it was not until the important suggestion of the application of the rubber dam by Dr. Barnum that the process of "air drying" for the purpose of obtunding sensitive dentine was satisfactorily accomplished; the value of this device was, however, immediately recognized in this connection as a means of affording to patients, during the process of excavating tender dentine, an amount of relief equal to that which it afforded the operator during the process of introducing the filling.

Having then attempted first to secure and maintain the most perfect dryness of the cavity possible, and having given a little time for the perfection of the drying after the usual preliminary bibulous paper or muslin absorption of the bulk of the fluid present, the first method of overcoming the difficulty is the mechanical one of relying upon *rapid cuts* with *sharp* excavators.

This is oftentimes extolled as the best and most reliable of all means for the accomplishment of this purpose, but, in my experience, I must admit that I have noticed this to be more generally the testimony of operators than of patients; but it is unquestionably true that this means is oftentimes sufficient for the attainment of a result satisfactory alike to patient and operator.

It will be found even in this procedure that attention to the direction and manner of excavating will add to the average of success, and that thus the careful placing of the excavator in the deepest part of the cavity, and its rapid drawing *toward* the orifice, will be compensating, by severing the connection of the sentient tissue with the dental pulp, and thus excavating the diseased portion *with the grain*, instead of across it or against it.

In the use of the burring engine for this purpose, it seems practically unnecessary that this care should be used, for the rotation is so rapid that many cuts are given by the *mere touch* of the bur-drill, so instantaneously as to defy any great appreciation of infliction.

(To be continued.)

A CAUSE OF FAILURE OF FILLINGS.

BY GEO. S. ALLAN, D.D.S., NEW YORK.

ALL dentists recognize the fact that a healthy, sound tooth cannot decay so long as it is kept absolutely clean, and also that just in proportion as these essentials are wanting dental caries will, sooner or later, accomplish its work of disorganization and destruction. In operating, then, they should keep this ideal tooth constantly in mind, and the end and aim of all work done on the natural teeth should be to bring them as near as possible to the condition of this model.

Theory and practice run more closely together in the art of filling teeth than in many other cases, and both are based on the fact foreshadowed in the above statement, that caries of the teeth is a chemical decomposition of the substance of the tooth, and in all cases the action commences on the outer surface of the teeth and works from the surface towards the center. If it was possible, after removing the decayed portions of the teeth and polishing them, for the patient to keep them in that condition, further work would be unnecessary; but, as he cannot do so, the operation is completed by filling the cavity with some proper substance,—one that will retain a polished surface, and that will resist the corrosive action of the fluids of the mouth.

Three things, then, take part in this class of services,—a suitable foundation to work on in the decayed tooth, No. 1; a filling material, No. 2; and skill and judgment to combine, No. 3. These three enter in ever-varying proportions in all cases of filling teeth, and on their judicious combination depends the measure of success attainable.

With most dentists, the mechanical idea is ever uppermost; little thought is given, as a rule, to any structural peculiarities of the organs which they work on, especially to their minute or histological points. They confine their attention to removing the decay, shaping the cavity, and filling the same with gold or other material, and all the while treat the tooth, as far as possible, as they would the same amount of dentine and enamel out of the mouth.

Now, there are good reasons, at least to the writer's mind, why this should not be the case. Living tooth-substance should not be handled in the same manner as dead tooth-substance, and dead tooth-substance demands more special care and judgment than is usually awarded to it; and both demand that due thought should be given to their separate characteristics, as well as to their position in the mouth and their forming a part of the living organism.

And first in regard to dead dentine,—ivory. It cannot be handled in the mouth as it can be out of the mouth, for the reason that in the mouth it slowly but surely deteriorates and loses the qualities it had at

first. Just as wood becomes rotten by prolonged soaking in water is ivory affected in like conditions, and the more impure the water, the more rapid the destruction in both cases. It is a common remark that dead teeth decay more rapidly than living ones. Even where rapid decay does not take place, the whole substance of the tooth becomes weakened and gradually breaks down. A builder would use the expression that his foundations were giving way, and the expression would be an apt one. Now, this change is not due wholly to its being extra-vascular, withdrawn from the life-giving properties of the pulp,—for ivory changes its properties very slowly indeed so long as it is kept dry,—it is the action of the water that produces the breaking down.

Desirous of knowing the facts of the case as understood by the trade, I made a visit to a dealer and worker in ivory, and questioned him as to the effect of water on ivory. He said that in water it became discolored, rotten, and valueless, losing its wonderful elasticity, toughness, and in a measure its hardness, so that it was a matter of great importance to them to keep their goods and stock not only away from water, but in as dry an atmosphere as possible. Ivory was liable, he said, to warp, shrink, twist, crack, etc., in like manner as wood, and under similar influences.

As to insure the stability of a filling the integrity of the tooth is quite as essential as that the filling should be perfectly adapted to the walls of the cavity, and remain intact, it would seem that in these cases there was great room for doubt as to durability. The qualities of toughness, elasticity, and hardness in a tooth are very important, and cannot be dispensed with without taking greater risks than ordinary cases require, and, as a rule, they are greatly relied on as a basis for good, honest work. If these qualities are wanting to begin with, the difficulties of an operation are greatly magnified, other things being equal. But if they are present at first, and afterwards become gradually extinct, though the work may be the easier accomplished, the subsequent failure of the operation is as certain; though, for that matter, it may be much longer delayed. Every increase, then, in the size of a cavity, and each departure from the type of healthy, fresh dentine, has its important bearings on the question of stability and success.

It would thus appear that in the case of dead teeth not even the most perfect operation, especially if it was a large one, would be certain to save the tooth for any great length of time. It would gradually fail through the inherent weakness of its foundations, caries would find it an easy prey, and it would constantly be liable to breakages, etc. In truth, is not this the common history of such cases? and is it not, except under very favorable conditions, bad practice to use a large amount of force and time on devitalized teeth? Would it not, then, be better to tell patients frankly what they may expect? Ask to see them

frequently, and make your operation more simple in its character, so that it may the more easily be watched and cared for.

So much for teeth from which the pulp has been removed. Next, has the matter of dead dentine any part or parcel in the case of living teeth? I think it has.

Some time ago I found it necessary to remove a large, soft gold crown-filling from the left inferior second molar of a new patient. The failure was at the posterior margin of the filling, just at the point where, other things being equal, there was the least likelihood of a leak occurring. It was at the point where, most probably, the first pieces of gold were placed, and in front of the line of direct pressure. The tooth was a living one, and, generally speaking, all the elements of success were present. The dentist who filled the tooth had maintained for years a reputation almost unequaled as a skillful, careful operator, and the patient was one of those extra particular ones whom it is a pleasure to work for. It was puzzling to make out just where the cause of failure belonged.

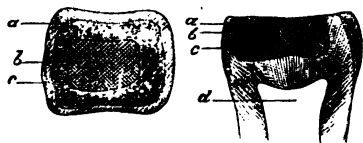
Close examination of the cavity, after the filling was out, revealed the fact of a deep undercut, where the discoloration and crumbling had commenced, and after-thought satisfied me that "dead dentine" was the sufficient explanation of the failure, and that the axiom, so commonly referred to in mechanics, that "the strength of the whole is only equal to the strength of the weakest part," had here another proof of its inflexible application. A bridge to be durable must have its foundations immovable, and one weak part or portion may pave the way for the destruction of the whole, and, in like manner, one faulty spot in the walls of a filled cavity may lead to the undermining and ultimate failure of the most finished work of the best operator.

The source of vitality of a tooth, so far at least as the dentine is concerned, lies in the pulp, and the maintenance of vitality in the dentine is due to the dentinal tubules, and through them, it, the dentine, is nourished and vitalized throughout its substance. Here it may be as well to say that the term tubules is used designedly, for, let their contents be fluid or semi-fluid, gelatinous or semi-gelatinous, or solid, they are tubules still, in the sense that their contents can easily be evacuated and other material substituted in its place. This fact being recognized, it follows as a necessary sequence that *any portion of the dentine of a tooth separated from its pulp by the severance of the connecting tubules becomes thereby dead dentine, and necessarily partakes of the properties and peculiarities of the same.*

In the case in question, almost the entire septum of dentine lying between the enamel and the filling at the place of failure was cut off from the pulp, and, if my reasoning is correct, became a weak spot; not on account of any lack of skill or ability in packing the filling, but

because the devitalized dentine at that point, gradually disintegrating and inviting carious action, failed to protect the gold filling.

In order that the reader may the better understand this case, and, what is of more importance, the principles suggested by it, two cuts are given,—one showing the position of the filling in the tooth, the other an ideal section through the tooth, filling and all, showing the course of the dentinal tubules, and the amount and position of the portions of the dentine cut off from the pulp. An inspection of the cuts shows that the posterior margin of the filling more closely approximated to the line of union of the dentine and enamel than either of the other three, and that there was, at the same point, quite a deep undercut, so deep as to entirely disconnect the dentine above it from the pulp; and it was, therefore, in the full meaning of the term, dead. It had, therefore, lost its toughness, its elasticity, and hardness, and, with the loss of these properties, so essential to permanency, the door was opened for others to step in, the opposites in all respects of those named. It became soft, friable, and weak, and presented, therefore, not only a diminished resistance to the active agents of caries, but possessed within itself the slow but sure elements of disorganization and decay.



a, enamel; b, septum of dentine where filling had failed; c, gold filling; d, pulp cavity.

An objection might be urged by some, that accepting this theory as correct, then the whole ring of dentine circling the filling would be devitalized, and that all portions of it should have suffered in like manner. In answer to this I say that the greater thickness of the three sound walls in a great measure protected them, and, furthermore, that they still possessed a little vitality, transmitted to them by the anastomosis of the terminal ends of their dentinal tubules, with their nearer neighbors still holding connection with the pulp. The two reasons combined seem to me sufficient to meet the objection.

It is even possible that, in some respects, a tooth having portions of its substance cut off from its pulp is specially liable to fail. There must from the very nature of the case, be a loss of homogeneity in such a tooth, and therefore physical as well as chemical laws would operate to its disadvantage. Expansion and contraction would be unequal. Moisture, heat, force in fact of any kind, would find an easier victim.

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Having had my attention drawn to the above-named facts and principles for a year or so, I have constantly been on the lookout for proofs of their correctness, and have been rewarded with a fair amount of success. One indication of its truth has often presented itself. I allude to those cases where, without there being any caries proper present, there has been a line or margin of discoloration extending back from the filling, fading out gradually and oftenest of a brown color. The

dark portions in these cases have always been found to be hard, and, when tested by an excavator, brittle also, and they have almost invariably been in such positions that I could diagnose to a certainty that they were disconnected from the pulp. With patients whose teeth were liable to caries, these portions would soon become soft or leathery; but in strong, healthy mouths, where there was not a predisposition to caries, this peculiarity would be very persistent, and might even be left with safety. It has also frequently seemed to offer an explanation for the too common failure of large approximal fillings. The dentist dreads them, and therefore, to make his success as certain as possible, fashions deep retaining-points, or shoulders at the neck of the tooth, cuts off the tubules, and thereby weakens his tooth and loses more than he gains.

It is frequently much easier to point out a source of trouble and danger than to tell how to avoid it. I have indicated in what has been said what appears to me a common error in the methods of excavating to shape a cavity for filling. The "how to avoid it" must be solved by every operator for himself. To begin with, he should fix in his memory the general course and direction of the tubules of the different teeth. This can readily be done, and, bearing it in mind, he will be surprised how often he can avoid cutting them and at the same time properly shape his cavity. He will gradually learn thereby that very deep under-cuttings can safely be dispensed with, and also that they can be made at the periphery of the dentine to better advantage than deeper in. He will protect his dead dentine by fillings within the cavity, of course, and without he will be chary of removing the enamel, for his judgment will tell him that dead dentine, with the cut ends of the tubules closed, will last longer than where they are open; and, last of all, he will avoid large, heavy gold fillings where he cannot be certain of the integrity of his walls, and I might add that he will cut away walls which, though apparently strong at the time, are certain to become weak with the lapse of time.

The lesson I have learned has been not only one of caution in undertaking a large class of operations, but also in criticising the work of others. The theory I was brought up to believe in completely was, that good, thorough work invariably protected teeth from further decay. To say the least, I doubt this now very much, and fully believe that there are many cases where tin foil and Hill's stopping, or even amalgam, will do more real protective service than the most carefully-packed gold filling. In mouths where the tendency to caries is great and has progressed to such an extent as to necessitate heavy work, I do not feel that I can conscientiously tell my patients either that gold is the best material to use in all their teeth, or that with any kind of work I can promise them perfect protection and immunity from further trouble.

SUPERFICIAL CARIES; V-SHAPED SPACES AND RESTORATION OF CONTOUR.

BY MARSHALL H. WEBB, D.D.S., LANCASTER, PA.

(Read before the Odontographic Society of Pennsylvania, October 7th, 1874.)

ORIGINAL imperfection of tooth-structure, especially where the teeth are in contact so as to favor lodgment for foreign substances; insufficiency of calcareous constituents in the central portion of the enamel prisms, and an unusual number of interglobular spaces throughout the dentine; incomplete coalescence of the prisms at the sulci and fissures of bicuspids and molars, so that particles of food may be impacted into these interstices during mastication—all such conditions establish a proximate cause of caries, so that when these substances are converted into an acid product, the teeth are soon involved in disintegration.

Certain conditions of the oral cavity may favor the formation of acids, as well as the parasitic plant—the *Leptothrix buccalis*—which is regarded as having very much to do with the progress of dental caries. Soon after the dissolution of the enamel, the leptothrix has been observed to have penetrated deeply into the clefts and interstices of decalcified dentine and to have extended its influence through the canaliculi toward the pulp.

Since microscopical investigations have been made in this department of science, observations have taught that the tubuli adjacent to disintegrated dentine become enlarged, and that, too, in cases where, by unaided vision, the dentine would have been pronounced normal and caries be considered only superficial. Lieber and Rottenstein attribute this enlargement of the tubuli to granulations of leptothrix.

In view of the discoveries made in relation to the etiology of dental caries, it seems reasonable to infer that acids and elements of leptothrix penetrate the fissures opened in the enamel and further disintegration ensues, and, upon reaching the dentine, the destructive process goes on with accelerated rapidity. By the almost constant proliferation of leptothrix the decalcified dentine becomes decomposed into irregular parts, which, near the surface, are separated into yet smaller parts, and the destruction of the tissue is thus finally completed.

In consideration of all this, it would appear that if caries be superficial, the remaining tooth-structure can be saved by the removal of such decay, but if the dentine be involved, nothing but magnified perceptive power can ascertain whether elements of leptothrix remain in the tubuli or not, even when all decomposed matter is supposed to have been removed and the surface polished. If the walls of the tubuli be distended, and elements of leptothrix remain, then caries will, very probably, again ensue, especially if there be an acid condition present, which acid, besides doing its work of decalcification, also favors the

proliferation of leptothrix,—it having been observed by Lieber and Rottenstein that this parasite flourishes most luxuriantly in acid solutions. This recurrence of caries will not take place if a portion of the disintegrated dentine remains at the bottom of deep cavities, for when all save this has been removed, and the cavity of decay is filled with gold, or whatever substance may be indicated, so as to exclude air and moisture, such fungi perish; or the destruction of the leptothrix may be previously accomplished by an application of carbolic acid.

Under favorable circumstances calcareous deposits appear to first fill the tubuli, commencing at the exposed portion of dentine, and sometimes resulting in a formation, known as secondary dentine, upon the interior surface of the pulp chamber.

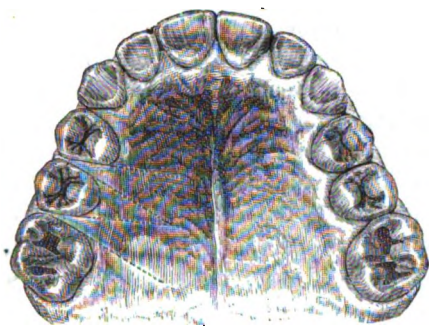
When dentine is exposed, through the removal of supposed superficial caries, or otherwise, and before calcareous matter can be deposited, decalcification may continue, the elements of leptothrix proliferate, and decay again be the result. In cases where the dentine is involved, therefore, it is best to remove the carious portion, excepting that which may directly cover a nearly exposed pulp, and fill the cavity with gold rather than cut away tooth-structure sufficient to obliterate the caries.

If a patient be under the control of a practitioner from the period of the eruption of the teeth,—deciduous as well as permanent, or during the eruption of the latter,—caries of the proximal surfaces can be prevented by frequent and thorough polishing. When, however, the patient is not seen until the greater number or all the permanent teeth are erupted, a different course may be indicated. If the teeth are not of a dense character, so as to withstand the almost constant attack of destructive agents, and the oral secretions indicate a decided acid reaction, caries may be found in the sulci and fissures and upon the proximal surfaces.

All teeth indicating liability to decay should be separated by pressure, and, if superficial caries be revealed, it should be removed and the surface polished. Whether the proximal surfaces be involved in the carious process or not, it is often well to so change the form of this class of teeth as not to favor the retention of foreign substances when the teeth, thus separated, shall have returned to their normal positions. The formation of single V-shaped spaces between the teeth accomplishes this, though but little permanent separation is necessary to facilitate the removal of foreign particles by the free passage of saliva or otherwise. Such separations, with a good form of tooth yet presented, are here illustrated.

When, however, superficial decay is removed, or carious dentine cut out and the cavity properly filled, the surface thoroughly polished, and the teeth cleansed and frequently examined, there is little danger of a recurrence of caries.

The proximal surfaces of the dense yellow teeth—those designated first-class—come into close apposition, whilst the sulci and fissures are quite shallow—there having been perfect coalescence of the enamel prisms. Dr. Robert Arthur presents illustrations of these, in his work on the "Prevention of Decay of the Teeth," to show how closely teeth come in contact; yet so rarely does decay attack such that permanent separation is unnecessary. In nature, where they are not of such dense structure, teeth are often so formed as to present, to a certain degree, V-shaped spaces between them.



In the formation of the single V-shaped spaces, the fact should be kept in view that the teeth almost always again come in contact, and that some provision should be made that such contact be where caries will not be likely to recur. In cases where tooth-structure is such as to yield again to destructive agents, the point of contact had best be so far underneath the margin of the gum that when it returns to a normal condition, and the teeth to their former positions, there shall be about a third of a line of it visible between the surfaces of the teeth most nearly approximating. From the point of contact, the buccal edges of enamel of each approximate tooth thus separated should be parallel, with but a small space intervening.

In forming the proximal surfaces so that a V-shaped space, extending from the buccal and widening toward the palatal or lingual surfaces of the teeth, may be made, but little loss of structure is necessary other than to convert the convex proximal into a plane surface, after separation by pressure has been effected. The corundum disk, if properly used, is invaluable in such operations upon the proximal surfaces, but its abuse often leads to undesirable results.

In the removal of superficial caries from the proximal surfaces of incisor teeth, it is well to apply the rubber dam, in the same manner as when fillings are to be inserted; then, with a keen separating file, cut away the greater portion of decay, and entirely obliterate the disin-

tegrated tissue, and shape the surface nicely by means of emery cloth—finishing with the finer grades. V-shaped spaces may also be made in very much the same manner with the safe side of the strip cut from the emery cloth resting upon the labial margin of the proximal surface, whilst the emery is made to cut the palatal edge of the other tooth. Emery cloth also serves an excellent purpose in the completion of fillings which have been inserted in such proximal surfaces, and better enables one to retain or change the form of the tooth more artistically than where a disk is used. When the rubber dam is removed, the polishing of the surfaces can be completed by pumice or pulverized siliceal mounted upon linen tape.

Very often, through neglect or from improper management or imperfect operations, cases present where decay has been extensive. This extensive disintegration may be revealed either before or after the period of the eruption of the *dentes sapientiæ*, and, in many instances, then only through manifestations of pain or from fracture of enamel. Such cases necessitate compound fillings, and, very frequently, restoration of the contour of the tooth. These are the cases, also, where the approximal surfaces of two teeth are usually involved, and where the substitution of gold for lost tooth-structure should be such as to quite fully restore the original contour. Indeed, from the smallest cavities of decay wherein dentine is involved, to those where destruction of tissue has been such as to necessitate, or at least indicate restoration of contour, the cavity should be well prepared, the gold thoroughly impacted, and the part built out to, or a little beyond, the original fullness, so that with the filling completed, and it and the adjacent enamel polished, there would be restoration of contour commensurate with the extent of destruction of tissue. Such restoration, with the further provision that when the teeth come into apposition the point of contact would be at the prominence of the gold near the buccal and masticating surfaces, is certainly correct, though difficult practice.

The entire margin against which the gold should be packed would thus be free, and as the point of contact is where caries, almost always, attacks the proximal surfaces, the teeth could, therefore, be considered safe; for as all that portion not in contact with an adjoining tooth is usually free from disintegration in the primary stages of caries, it indicates that if there be not contact, or if restoration of contour be made so that the gold in one tooth may come in contact with that in another, caries will not be likely to recur.

In each case, especially where there is cause for suspecting caries upon the proximal surfaces, the separation by pressure and removal of decay if superficial; so forming the proximal surfaces as to allow V-shaped spaces between the teeth; the preparation and filling of cavi-

ties of decay when dentine is involved, and in the restoration of contour, where much destruction of tissue has ensued—all should be done faithfully and well.

Cases are constantly presenting where the extent of caries is so great, and connecting circumstances are such, as not only to try one's patience and ability, but also to test one's faithfulness. Such perplexing cases are often disposed of by what may be designated bad practice, and it is this which has interfered with progress. Faithful devotees to any calling are those most highly respected, favored, honored, and, coming down to a secondary consideration, most liberally remunerated.

DROPSY OF THE ANTRUM.

BY FRANK FAY, M.D., D.D.S., BRUXELLES.

(Read before the American Dental Society of Europe, July 2d, 1874.)

THE upper maxilla is subject, like all the bones of the human frame, to many diseases; in fact, its structure and connections make it even more so. As a description of its various diseases would fill volumes, I shall content myself with simply speaking of one, viz., dropsy.

It consists in the accumulation of a mucous fluid, secreted by the lining membrane of the antrum, which communicates with the middle meatus of the nose by a small opening. This membrane is extremely thin and sensitive. Its functions are the secretion of the pituitary fluid, which in a normal state is small in quantity; but in inflammation the secretion becomes very abundant, and tends to collect in the antrum.

Now, there are two causes which prevent the escape of this mucous fluid; namely, inflammation of the membrane which passes through the opening, and the thickening of the secretion.

Some authors attribute the cause of dropsy to the perfect closure of the opening, but this perfect closure has not been clearly demonstrated; at all events, it can only be a secondary cause; at the same time it is evident that that which tends to close the opening must favor the disease.

Boyer says that this disease declares itself mostly in young persons, who will frequently attribute it to a blow received on the maxilla some time previous. It is also said that the root of a tooth penetrating into the antrum will cause it, but I do not think that such would be the case if the root were healthy; should the root, however, be a diseased one, its presence might cause an inflammation of the surrounding tissues, and thus the disease may spread.

(Dubois speaks of a case of dropsy caused by the presence of a tooth imbedded in the antrum on the sub-orbital surface.)

One of the most likely causes is catarrh, which we know has the effect of greatly thickening the secretions of the affected tissues.

A quantity of mucus collects in the antrum, and remains there for some time before producing any apparent effect on the face, or having any great influence over the bone itself. The quantity of fluid inclosed in the cavity must be considerable to force the parietes out of their ordinary position. The anterior wall generally protrudes the first, and it would strike one that the reason of this is that the anterior wall is the thinnest; but this is not the case, for on examination we find that the nasal wall is the thinnest. Now, the question arises, Why should the anterior wall be the first affected? It may be attributed to the fact that the inferior or palating surface being obliquely situated has its lowest point to the front, and then the fluid contained in the antrum has its greatest weight thrown on the anterior wall. If we admit that the pressure is equal on all sides, it is hard to conceive of the existence of such a tumor so long as the natural opening of the antrum exists. The anterior wall forms a tumor, which gradually increases; it is spheroidal, smooth, and hard; the skin scarcely changes color, and moves easily over its surface. As the tumor grows, the bone gets thinner, and will give way on pressure; it may even be absorbed, so that the tumor will be covered only by the integuments of the cheek.

The fluid contained in the antrum is generally of a yellow color. I mentioned just now that this disease generally acted on the anterior wall of the antrum, but this is not always the case, for it sometimes happens that the dilatation takes place in all directions. In such a case the diagnosis is more difficult, and it may be mistaken for some hard tumor occupying the antrum. The diagnosis is generally easy, but there are certainly exceptions. Before coming to a final decision as to a case of dropsy, it may be well to make an exploratory puncture, which is a simple operation, and in many cases will prevent performing a more serious one for the removal of a supposed malignant disease.

Nélaton proposes to make an exploratory puncture, and adds that a free incision is good, not only to evacuate the fluid, but also to make a thorough examination of the parts.

Dropsy of the antrum may be confounded with mucous cysts, and some authors have described them under the same head; but the skin over a mucous cyst presents a grayish-blue appearance, whereas in dropsy it is more yellow; there is also pain attendant on mucous cysts, whilst in dropsy there is little or none.

Other diseases which we must diagnose are abscess, osseous cysts, and osteo-sarcoma.

If dropsy presents itself in the simplest form, that is, with the anterior wall of the antrum dilated and giving way with crepitation on pressure, it would be difficult to mistake it; but if the antrum is distended on all

sides, it may be more difficult to diagnose the case; but then we may remember that dropsy presents itself most frequently in young persons, whereas malignant tumors usually appear in those of advanced age.

Abscess may be mistaken for dropsy, but inquiry into the case will overcome any doubt; for an abscess is generally the result of some known cause, and has been preceded by symptoms of acute inflammation. There is also a discharge by the nose, and fistulous openings sometimes declare themselves. These symptoms are sufficient to show that the tumor is not caused by dropsy.

Osseous cysts are the most difficult tumors to diagnose from dropsy; in fact, the symptoms are so much alike, that it is only by puncturing that you can really determine what they are.

There still remains osteo-sarcoma, which from its commencement declares itself with shooting pains, the skin becomes varicose, the tumor is not smooth as in the preceding cases, but uneven and nodular. If these symptoms are not sufficient, an exploratory puncture will settle the question.

As the cause of dropsy of the antrum is not always the same, we cannot lay down any one course of treatment as the right one. There are several modes of treatment, but our first aim in all should be to evacuate the fluid, and next, to get rid of the cause.

The first operation I will mention is perforation at the summit, as done by Dr. Lamorier. He proposes to perforate the maxilla between the malar fossa and the third upper molar; the bone is rather thick at this point, but it can be pierced with very little trouble. However, there are objections to this process:

1st. That the space left for the opening is not large enough.

2d. It is very difficult to explore the antrum from this position.

3d. When performing an operation we try, as a rule, to disfigure the patient as little as possible; now, the malar fossa is not very easy of access, especially when the parts are not in their normal position; therefore to perform the operation it is sometimes necessary to divide the lips at their commissure, which certainly leaves an ugly mark, particularly when performed on the fair sex.

The next operation I would speak of consists in perforating the maxilla in the canine fossa; it is easy of access, the bone is thinner than in the malar fossa, the antrum can be very easily examined from this position, and it does not disfigure. This method is much approved of by Dr. Michaux.

There is still another operation which I must not neglect to mention. I allude to a case of dropsy caused by a diseased root or periodontal membrane. The principle now is to remove the cause, and when you know that it is a root that gives the trouble, it is right to extract it. The fangs of the second upper molar often pass into the antrum, so

that when this tooth is diseased it should be removed. Some authors suggest the removal of a sound tooth for the cure of dropsy, as they say that perforating the alveolus is a good plan to cure the disease ; but, in my opinion, if a tooth is sound, we should not remove it, as that is going in direct opposition to the views we have in conservative dentistry.

There are many other ways of operating for this disease, but none of them present the same facility and advantage as the perforation of the canine fossa:

Catheterism, as performed by Jourdan and Allouil ; which operation is not only difficult, but will not always answer.

Perforation of the palatine arch, by Callisen ; this is objectionable for the reason that the sinus which necessarily ensues is very difficult to heal, and impairs articulation very much ; sometimes the sinus will not close by itself, and another operation has to be performed, or else the patient is compelled to wear an obturator.

There is still another operation, which has been performed but once, and that is perforation through the floor of the orbit, by Dr. Bertrand, in 1819. The case is reported in the "*Mémoires de l'Académie de Chirurgie de Paris*" (tome iv. p. 370).

The next thing that requires our attention is how to prevent the recurrence of the disease. This is done by injections, and by the introduction of pieces of lint. Injections may be made with warm water, astringents, glycerin and water, dilute carbolic acid, etc., which must be injected several times a day. Dr. Garretson recommends glycerin $i\bar{3}$; tinc. opii camphoratæ, $ii\bar{3}$; and aqua coloniæ, $iv\bar{3}$. If the introduction of lint is preferred to injections, you can use either dry lint or mèches previously saturated in carbolized oil or ointments. This plan is most easily adopted when the antrum has been opened in the canine fossa. In introducing lint, care should be taken to fill the antrum as full as possible, so as to prevent the reaccumulation of the fluid. Of these methods, that preferred by my father, and with which he has been most successful, consists of injections of diluted hydrochloric or carbolic acids and maintaining the opening by tubes.

PIVOT TEETH.

BY J. G. VAN MARTER, D.D.S., BASEL, SWITZERLAND.

(Read before the American Dental Society of Europe, July 2d, 1874.)

AFTER a careful review of dental literature and dental discussions for the past five or six years, and a somewhat extended observation on the subject of pivot teeth, I have come to the conclusion that, if not

one of the lost arts, certainly the subject has not received the attention it merits. The pages of our dental journals, the discussions of our American dental societies, yes, and the lectures in our dental colleges, are singularly free from any allusion to the subject. The only report of operations which I have noticed from any of our colleges the past year, is from the Dental School of Harvard University. In this school the total number of patients was two thousand and sixty-five; number of teeth extracted, seven hundred and twenty-eight; number of teeth filled, seven hundred and sixty-four; twenty teeth mounted on gold plates, twenty-five on silver plates, and two hundred and eight on rubber plates. Teeth inserted on pivot, *none*. If pivot teeth have not fallen into disfavor and disuse by most practitioners of our profession, there seems at least to be far too little thought or attention paid to improving old methods, or to discovering new methods of setting them. We are left, in the present condition of things in regard to pivot teeth, to infer that the last few years of dental progress have supplied far better substitutes for broken-down teeth with good sound roots, than a good artificial tooth on pivot. Before stating our own method, we will call your attention to what some of our modern standard dental writers have said in favor of pivot teeth. In Harris's work on "Dental Surgery," we are told that "this method of securing artificial teeth—on pivot—on natural roots was, until recently, on account of its simplicity, more extensively practiced than any other; and, under favorable circumstances, is *unquestionably* one of the best that can be adopted. If the roots on which they are placed be sound and healthy, and the back part of the jaws supplied with natural teeth, so as to prevent those with which the artificial antagonize from striking them too directly, they will subserve the purposes of the natural organs more perfectly than any other description of dental substitute, and can be made to present an appearance so natural as to escape detection upon the closest scrutiny."

Dr. Richardson, in his work on "Mechanical Dentistry," says "that the process of pivoting or grafting an artificial crown upon the root of a natural tooth has been long practiced, and, when skillfully performed, with intelligent views of the various conditions which recommend and justify the operation, it affords a valuable and *unobjectionable* means of substitution."

Dr. Taft says, in his "Operative Dentistry," that "the pivot teeth are now far less frequently worn than they were formerly, because perhaps of the improved methods of inserting teeth on plate;" and that "under favorable circumstances, however, they may be worn with great comfort and usefulness from five to fifteen years."

Dr. Tomes, in his "Dental Surgery," says "the operation of pivoting, when undertaken under favorable circumstances, and carefully per-

formed, produces a very satisfactory result;" and that "they may be made to last twenty years, or even for a longer time."

Many others could be quoted who speak as favorably of pivot teeth, but the above will suffice our purpose. From these writers on dentistry, we learn that pivot teeth subserve the purposes of the natural organs more perfectly than any other description of dental substitute; that they are valuable and unobjectionable, and may be made to last twenty years, or even for a longer time. All agree that there is no other artificial substitute which imitates nature so perfectly, and which, when well made, may be worn with so little discomfort to the patient. If this be true, why has not more been said and written on the subject?

May we not demand a reason for neglecting the "most perfect dental substitute,"—a substitute that imitates nature most perfectly, and is unobjectionable, and, when skillfully made, escapes detection upon the closest scrutiny? I have never heard or read as strong testimony for any other dental substitute. My own experience and observation attest the truth of the strongest words in favor of pivot teeth under many circumstances, and in a large number of cases, where they are entirely neglected. There are many reasons why pivot teeth have fallen into disfavor or disuse, prominent among which are the "painless extraction of teeth," and the ease with which substitutes may be replaced on a cheap base, like rubber,—thus opening a wide field for poor operators, "steam dental associations," and a low class of mechanical workmanship, to take the place of the dental surgeon and artist.

Cohesive gold, with the mallet and the blessed rubber dam, have no doubt led many a young and enthusiastic operator to build up or contour teeth, when a cultivated artistic taste, a proper knowledge of the case, and a little *conscience*, would have plainly indicated pivot teeth.

Cohesive gold and contours being the fashion, the would-be leaders have led the hobby-horse advance, oftentimes to the neglect of things of real merit. Again, the poor pivot has been obliged for years to run the gauntlet between the operative or would-be legitimate dentists and the mechanical or true dental artists. Disowned by both, it has been obliged to stand aside and witness the battle, not of the gods, but of cohesive gold, the mallet, and the rubber dam, against rubber, block teeth, celluloid, and such bases and materials, in their mad endeavor too often to deface the natural expression. I believe in contour fillings, and make them where and when the case demands it; but never, when they will disfigure the natural expression and make our art too conspicuous, nor when we can make a more durable substitute, which will effectually conceal our art. These few reasons—from many—why we think pivot teeth have been neglected, are all we have time to notice here. All agree that the metal pivot is the strongest, most durable, and least objectionable. All agree, also, that the root should be capped

as perfectly as possible, as herein lies one of the secrets of the durability of pivot teeth. I have tried many methods of setting pivot teeth, but will only describe one which Dr. Terrey and myself hit upon, and which I have practiced for the past six years with great satisfaction. We will suppose the root prepared to receive the finished tooth.

I use generally for pivot No. 24 platina wire; and common plate teeth; after grinding to fit the root as perfectly as possible, I back the tooth with a strip of thin soft platina plate, No. 36, and leave the backing long enough, after it is attached to the tooth, to bend at right angles and form a cap for half of the root. I then punch a hole for the pivot and trim the platina to about the size I wish. I then cut a cap of the platina plate the size of the root, punch a hole where I wish the pivot, and when the pivot is prepared and flattened where it is to be attached to the tooth, I insert it through the backing and through the cap proper, and carry the pivot to its place in the root; and holding it with the left hand, burnish the cap and backing down perfectly over the root, and then remove it and attach the pivot and tooth with wax. I then carry the pivot to its place, and when the tooth is adjusted it is carefully removed and imbedded in plaster and sand for soldering. When soldered and finished, I fasten the tooth in place with Hill's stopping or shellac. For this purpose I use a wooden tooth-holder, and when the Hill's stopping or powdered shellac is placed in the root as I desire, I warm the pivot and tooth, which is held in the wooden holder, gently over the spirit lamp until quite warm, and then press home to its place. Any excess of Hill's stopping may be easily trimmed away, and the job is complete.

A little experience will enable one to make such a pivot tooth very quickly, and accomplish all that can be done by the most complicated and tedious methods. In the last six years I have set a large number of teeth in this manner, and have watched them carefully, and find them firm, free from decay, and giving the greatest satisfaction.

So long as I can secure such results, I consider it a duty not only to my patient, but to my profession, to keep as close to nature as possible, and preserve the form and color and appearance of the natural organs. The best artist is he who best conceals his art. The above method has proved very satisfactory in our hands, and we find it good for the following reasons: 1st. We have the strongest and most durable pivot, and one that will not expand and split the root. 2d. We have a metal pivot and backing, and cap in one piece with a good surface. 3d. We have a most perfect protection for the root. 4th. We have not only the simplest but the quickest—if not the best—method of setting a pivot tooth with a metal cap. This method has the advantage of simplicity and durability, and is easy for both operator and patient. Before I adopted this manner of setting pivot teeth, I dreaded it, but since, I

do it with pleasure. I am satisfied that the "coming man" in dentistry will so far recover the lost or neglected art of pivoting teeth *well*, that "contours" will not be so fashionable, nor will there be so many artificial teeth inserted on plates. The time may come when prevention will be more popular than cure, simplicity preferred to complexity, and intelligence, not ignorance, be the rule.

" We may not live to see the day,
When earth shall glisten in the ray
Of that good time that's coming!"

but in the mean time, while we advance, let us take humanity as we find it, and do the best in our power for each particular case.

HINDOSTAN STONE.

BY GEO. S. ALLAN, D.D.S., NEW YORK.

SHORTLY after the introduction of the burring engine, the search for natural and artificial stones to use with it commenced: their necessity and value being apparent. Of artificial stones, the corundum was first tried, and has ever since held its own against all rivals. It is more than probable that it will never be superseded. To Dr. A. L. Northrop belongs the credit of its introduction.

It was more difficult to find a natural stone having the requisite good points, and many trials were made before one was obtained. The Arkansas, the Wachita, the Lake Superior, and others were cut and mounted, but would not work, and were thrown away.

The qualities wanted were: first, hardness; second, a uniform, even grit, such as would cut without scratching; third, and most important of all, one with its cohesive properties so balanced that in use it would wear away without becoming polished, and yet maintain its integrity up to that very point; in addition, it should be what is called a water-stone.

Years ago, while in college, the writer was interested in grinding and polishing lenses, and he recalled the fact that he used a powder made from Hindostan stone to put the finishing surface on his glasses just before giving them the final polish with rouge, and it struck him that the same stone would meet the requirements of the burring engine. The experiment was at once tried. A stone was selected and broken so as to obtain a proper-sized piece. This last was then, by means of shellac, mounted on a mandrel, and afterwards transferred to the engine, where on trial it seemed to meet satisfactorily all the requirements. Afterwards the stone was taken to one of the dental depots, and, after much trouble, specimen disks, wheels, etc., were cut and mounted, and

after trial placed on the market. From that date to the present time the demand for the various shapes and forms of this stone made has been constantly increasing, and the trade promises still greater development.

The powdered stone was valuable in lens grinding for the reason that it cut the glass rapidly and without scratching, and left withal almost a polished surface; the particles of which it was composed breaking down evenly in the process of grinding, proving that the stone, with other good qualities, possessed a very homogeneous structure. For dental purposes it is equally valuable. The operator requires a stone possessing just these properties. It should cut finely, evenly and rapidly, and leave no scratches in doing its work. The optician can take the glass from his tool at any moment, and wipe and examine it. The dentist has not a like privilege. The tooth or filling, or both, that he may be at work on, must remain in the mouth, and, as it is constantly wet with saliva, all scratches and blemishes of like character are hidden from view, nor can they be brought to sight without first drying the work,—a matter, as all know, of considerable difficulty and trouble.

In the solid condition it is not only available for the burring engine, but, cut into slips and pencils, can be used with the hand; in the shape of a powder the writer has employed it for many months, and has found it much more serviceable, safe, and efficient than powdered pumice.

To those dentists who wish to grind and mount sections of teeth for microscopic examination it will be found invaluable. For this purpose it is only necessary to take a slab, such as can be bought for a dime or two at any hardware-store, and use it as one would a metal plate and emery. With it sections can be made quicker and neater than by the old method, and, furthermore, the section will be almost polished when it is taken from the stone.

It will also do fair work as a whetstone; in fact, it is the ordinary whetstone used by carpenters and mechanics generally.

PROCEEDINGS OF DENTAL SOCIETIES.

AMERICAN DENTAL ASSOCIATION.

(Concluded from page 606.)

THIRD DAY.—*Morning Session.*

CALLLED to order at ten o'clock, President Buckingham in the chair.

Dr. Rehwinkel, chairman of the committee appointed last year to endeavor to procure the appointment of dental surgeons in the army and navy, reported that they had concluded that such proposed action was premature; the tendency of Congress is to cut down expenditures, and it was deemed expedient to let the matter rest for a time. The report was accepted, and the committee discharged.

The subject of "Operative Dentistry" being still open,

Dr. Cushing said that at the meeting of this association three years since, a paper was read on "*Light versus Heavy Foil*," in which the author, Dr. Abbot, claimed to establish by experiment the fact that a given cavity would contain more foil of a light number than of heavy. He had felt confident that this conclusion could not be true, and that the experiments had not been fairly made; nor could they be so when performed by the same person, who was not an expert in the use of one method, while he was in another. He had therefore instituted some experiments, with the same instrument. He had requested Dr. Allport, whose capabilities in packing soft foil would not be questioned, to fill the cavity in the steel plate twice; once with soft foil unannealed, and once with adhesive foil annealed. Dr. Allport had done so, packing the first with Abbey's No. 4 unannealed, with hand pressure, which he designated as an "old-fogy" filling; and the second with the same foil, annealed, packed with the mallet, in the usual way. The soft and adhesive foil fillings weighed exactly the same, seventeen and a half grains each.

The speaker had also made some fillings in the same cavity, with results as follows: No. 1, with Ashmead's No. 3 cohesive foil, small pellets, annealed as used, with fine-pointed plugger, weight fifteen and a half grains. No. 2, Williams's rolled gold No. 120, annealed as before, larger-pointed instrument, weight nineteen and a half grains. The speaker submitted these experiments that a record might not go out from this association that would lead to erroneous conclusions. For himself he preferred the heavier foils, and believes that in skillful hands they produce better results, on the whole, than lighter or soft; yet agrees with Dr. Allport that the quantity of gold in a cavity is not of so much importance as that it should be properly packed against the walls.

Dr. Butler thinks there is more time spent now on some classes of gold fillings than was demanded twenty years ago; an entirely different class of operations is now called for. If we spend more time, it is a necessity; many large fillings are now made that were not thought of a few years ago. People like fine things; there is a greater degree of refinement, and it runs through all their wants; they must go into luxuries as well as necessities, and fine fillings, even as far back as the third molar, are absolutely demanded. In the arts, fine productions must take time; a fine piece of work can be made into form quicker than it can be finished. It is the same with fillings.

As to rubber dam, why is thin the best? Thick is sometimes necessary, and causes no more pain. It is a mistake about wasting time putting it on; it is time saved. There is a certain class of patients for whom he could not be induced to operate, if he could not use rubber.

In regard to root filling, it is hard to conceive how a substance that is not plastic can be introduced as perfectly as a plastic material. If osteoplastic is carried in with the gold, it can be forced into every inequality more perfectly than gold. There is no rule for the kind of gold. Every one for himself on that question; but when restoration is attempted, cohesive must be used; but it is not certain that extra-cohesive will give good results. The walls are apt to be powdered. If soft foil were used, it could be made perfectly tight. He uses no higher number than 60; if confined to one preparation, would use Williams's No. 30.

Prof. Knapp. Is pleased with the report. It is easy to criticise; let those who do, try to make a better. Does not agree, however, as to the credit to which Dr. Arthur is entitled in the introduction of adhesive foil. Old members of the profession will remember that thirty years ago Leach made gold more adhesive than we have at present. There is far too much adhesive gold used to-day. He does not disparage but deprecates its indiscriminate use. It requires greater pressure, and soft is more safely used in frail teeth. It is not the amount of gold that is essential to preserve the teeth. It pleases the younger men to assert that fine work cannot be done without the dam, mallet, and adhesive foil; they are all good things in their place, but cavities on the labial surface have been excellently filled without the dam. Even cavities under the gum, unless extreme and bleeding, may be thoroughly filled and kept dry. When he sees skilled operators fail, he is led to inquire why we should put the patient to the expense of money and time necessary. If the cavity is properly prepared, and the gum treated two or three days, napkins would be sufficient. Rubber is not pleasant, and is carried to an unwarrantable extreme. Machinery is too frequently resorted to, especially by unskilled operators; too much is cut away; when the pulp is exposed there is great danger. Do we fill teeth to make jewelry, or to preserve them? They were preserved before adhesive gold or the mallet were used. The time, pain, and expense necessary do not warrant us in using these things indiscriminately. Had known bad effects, such as inflammation of the periosteum, from wedging and mallets.

Dr. John Allen said the report dealt fairly with the subject. We have great facilities at the present day, and the wonder is that as good work was made in old times as was made. As to the different methods, if our operations are good, it makes but little difference how we do them. Some will fail with soft foil, others with adhesive, and others will fail anyhow. The balance of testimony is in favor of soft gold. He can look back forty years and call to mind many fillings that are yet doing service. There are many outside of the profession who have aided us materially, and we should give them credit for the various

manufactures and improvements in teeth, gold, and materials. Dental science is advancing, with the exception of the artificial branch; in that we have retrograded.

Dr. Keely thinks that, with heavy foil and the mallet, we can pack to frail walls with greater certainty, ten to one, than by hand pressure and soft foil, and can lap the gold over and protect the enamel. With the engine, heavy gold, mallet and dam, better operations are made. If every one asks blessings upon the head of the inventor of the dam as often as he does, he will be abundantly blessed.

Dr. Kulp said that he occupied a peculiar geographical position, and saw operations from all parts of the country. His opinion, based upon what he has seen, was that those who use the dam and the heroic practice of dressing out cavities, and heavy foil, are the ones whose fillings show the best. There is very little danger of cutting away too much. We vacillate too much, to-day using one thing, and to-morrow another. We should stick to one thing and have uniformity. Had tried all numbers, from 2 to 120, and uses numbers 4 and 60. In building up, uses large instrument and No. 4 foil, which takes much less time. The dam is less objectionable than the wedge.

Dr. Rehwinkel. All our arguments now seem to tend against the abuse of good things. The report gives a faithful *résumé* of the subject. Different modes must be left to individuals. Operations can be and have been done without the dam, but those who did them would not now do without it. They find themselves relieved of mental anxiety in filling. It has been said, in fact, that a great objection to rubber is the habit it produces of leaving the patient half an hour to converse with others in the next room. There are many in the profession who could not fill a tooth without rubber or adhesive foil. The preceptor does not do his duty who allows a student to go out without instruction in both. Any young man who will learn to fill well with soft foil, will soon learn to do so with cohesive. As to root filling, if an outsider were to come in here, what would he think? All the advocates of different modes claim ninety-nine cases out of a hundred. No one tells you that the condition of the tooth or system has anything to do with it. It is the *sine qua non*. Now (to Dr. Wetherbee), you said that gold was the best under all circumstances; when you find it impossible to remove all the pulp, is gold the best for that case?

Dr. Wetherbee. I remove it entirely in incisors, cuspids, bicuspid, and molars, in from ten to twelve hours in all cases.

Dr. Rehwinkel. In every case?

Dr. Wetherbee. Yes, sir; in every case.

Dr. Rehwinkel. You have very funny people in Boston. (Laughter.)

Dr. Wetherbee. We have very sensible people there, and, beside, they have a dentist who knows his business! (Laughter and applause.)

Dr. Rehwinkel. He ought to add that the pulps of their teeth have sense enough to get out when they have no business there! People west of the Alleghanies are not so sensible, and their pulps stay as long as they can, and have to be removed by *hook and crook*! (Laughter and applause.)

Dr. Stockton. Teeth can be filled with each kind of foil that cannot be with the other. Uses an equal amount of both soft and adhesive, finishing with heavy. Some teeth he can fill more quickly with soft foil. We must not have our hobbies. Instruments and appliances are so perfect that operations should not be defective. He had repeated the ink experiments of Fletcher, of England, with entirely different results. Dr. Osmond asserts that after a filling has been malleted tight, it may be malleted loose, and Fletcher probably committed that mistake. The condition of the tooth has something to do with the choice of material. If the walls are frail, would not use gold, as the walls will be broken up. You cannot build a good house on a poor foundation.

Dr. Bogue. Fletcher has recalled his statements, and admits that tight fillings can be made with adhesive foil. Dr. Kulp's experience is valuable. We do not realize the differences that exist in teeth and in individuals. Instead of becoming a degenerated race, we are absolutely improving. Such children as would formerly have died are now reared. The same is true with regard to teeth; they were formerly indiscriminately slaughtered. The old fillings we hear of are generally simple crown cavities. Such fillings as are now inserted were not in existence. Filling cavities is different from building up crowns. Soft foil and napkins and a little labor will do one, but not the other. He was glad to see a return to the easy ways, where they were effective.

Dr. Judd. The spirit of the report has not been touched upon. The idea was that our practice should be so modified as to afford operations at a less price, that numbers now unable could avail themselves of them. There are conditions about this in large cities; there is there a class of people able and willing to pay for the best operations, and they will be satisfied with nothing less; they will patronize those who do work according to their notions. There are other operators who spend less time and labor and skill, and they will be surrounded by another class of patients; and so down to the man who slips into the five-dollar establishment for a set of teeth. Every grade is demanded. The country practitioner must fill all these requirements. The quick operator gets careless. The report was too conservative about the dam. It recommended the mean between two extremes, but in this case leaned from the median line. In long operations we should never dispense with it. Patients are glad of the rest it gives; confidence is given to the operator. Fletcher's experiments are not worthy of at-

tention. The recommendation of tin, in large cavities, does not meet with his (the speaker's) full indorsement. It saves simply a small amount of gold. He does not sell gold for a living, but charges for his time and skill and experience. Soft gold works as easily as tin.

In some cases too many fissures are cut out, but many operators do not cut out enough. Fissures are natural in many cases. Recommends cutting out so far as there is any indication of decay, but it is time enough when decay shows itself. Believes in filling canals with gold; there is no better material. Is gratified that there has been no cotton advocated in this discussion; it is a mark of progress. As to the possibility of filling all roots to the apex with gold, it can't be done. Has examined many specimens, and in many instances no instrument can be carried to the apex. (Dr. Wetherbee here stated that he did not intend to claim that all canals could be filled to the apex with gold.) As to opening them up by drills, it was a perfect failure, as a general thing; the drill was apt to run out at the side. He had seen a cuspid so drilled by a dean of a dental college (so called). He (the speaker) had filled it with oxychloride some years ago, and it was doing well. Is glad to hear a refutation of Dr. Abbot's experiments. We can fill teeth with adhesive foil and mallet, that are too frail to stand hand pressure. Many fine operators are very poor dentists. We have more disease from injudicious operations than from all other causes. Pulpas seem to die more readily under amalgam than gold.

Prof. Shepard. The report has been misunderstood, but it has furnished a stimulus for discussion. The principle of it is this,—a great many people are poor, and are sufferers; the great majority of dentists must be dentists to these poor ones. To those who minister to the rich, the expense of material is nothing, but the dentist to the poor must get pay for \$3 or \$5 worth of gold. The dentist who gets \$1 per cavity is just as respectable and just as much a benefactor as the one who gets \$10. This point is too much ignored. Prominent men have been considered to be those who get high fees, and not those who do most good. This last should be the standard. Country dentists are in the majority. The main objections to the report have been in regard to omissions; but telling how this or that is done does not properly come into this body. We would give credit to whom it is due; if Dr. Arthur had cared to take out a patent for adhesive gold in 1855, he could have done so, but he had published the thing abroad, and should have credit for it. It is almost impossible in college instruction to get students to care anything about learning to use soft foil or to fill a tooth without the dam. This is a great error.

Dr. McQuillen. The fees of a dentist do not give him reputation and position; it is the character of his operations. There is danger of cheap operations for the poor being misapprehended. Some of the best oper-

ators in the cities are supplied from the country. The talent of the village seeks the city, to enjoy the fruits of a reputation made by performing good operations for a small compensation. The best work should be done under all circumstances. He was opposed to the practice of filling roots with cotton. With respect to fissures in the enamel, the finest probes should be used in making an examination of the teeth, and where such an instrument catches, the place should be cut into and filled. These fissures, microscopical in size, often lead to dentine in which the interglobular spaces are abundant, or otherwise defective in structure, and sometimes they open into cavities in which caries has accomplished its work of destruction without presenting any external evidence of the fact.

Dr. Judd explained that what he said was that there were fissures upon every molar tooth; they are natural, and a part of its anatomy, and unless there are indications of decay, it is not best to cut them out under all circumstances.

Dr. Allport. Had noticed the experiments of Fletcher. No doubt some operators can pack cohesive gold sufficiently well to preserve the teeth; but it is not what a few of the best operators can do; it is the kind of gold best adapted to the skill of the mass of operators that should be generally adopted. It is not necessary to have Fletcher's experiments to prove that cohesive gold fillings leak. One-half of all the cohesive foil fillings are discolored; they are beautiful but worthless. The old-fashioned fillings of Harris, Maynard, and others, though so soft that you can stick a plugger through them, are to-day absolutely preserving the teeth; they are scooped out, but are saving the teeth. Why? Because the material was better adapted to the average skill. In some cases cohesive gold is necessary; there is not the same danger of fracturing the walls of a frail tooth, because it is not driven directly against them; when it is used, however, you should pack soft gold against the walls. Cohesive gold is very deceptive; you think you have a beautiful filling, but it will fail with ordinary operators. Did not use the rubber for a good while, but now finds the places where it is most difficult to apply, the very places where it is wanted, and can hardly do without it. As to fissures, there are natural fissures with no presence of decay; you may catch your instrument in them, and at the same time find no decay. When the tooth is decayed, it is time enough to fill it; but if the teeth are soft, it is safe to anticipate it.

Dr. Bogue, chairman of the committee appointed for the purpose, reported the following memorial resolution, which was unanimously adopted:

Whereas, This association has with sorrow learned of the death of Prof. Thomas B. Hitchcock, of the Harvard Dental School, one of our

most valuable members, and the chairman for this year of the Committee on Histology and Microscopy; therefore,

Resolved, That we signify in this public manner our sense of the great loss which the profession and the cause of dental education have sustained, and that this resolution be inserted in the records, in the place where the report of the committee would have appeared.

Adjourned.

Afternoon Session.

The subject of "Operative Dentistry" still under discussion.

Dr. S. B. Palmer said that tin foil had antiseptic properties. There is a chemical or galvanic action between all the metals we put in the mouth, and even between gold and tooth-bone. Chemical and galvanic action are synonymous. It has been generally supposed that bone, not being a conductor, no action existed between it and the metals; but when the galvanometer is applied, it is found to be otherwise. He had cracked a tooth and put it with gold into a dilute acid, and found that the tooth was being consumed. In an alkaline condition, the action is reversed. If the gold is pure, so much the worse for the tooth. The tin filling being in a loose porous condition, is itself consumed, while the tooth is preserved. For this reason, prefers it in the sixth-year molars, or in children's mouths, because it renders the tooth negative till it will stand the wear.

Dr. Walker. For operators outside of Boston, to remove all the nerve in every case is impossible. In root-filling it is not necessary to resist mechanical or chemical action, but simply to use something that will occupy the space and has an antiseptic property. The fissures in the canals can be better filled with Guillois's cement than with gold. Uses it a little soft, and pushed up with cotton.

Prof. Knapp. In cases of bleeding after extraction, which are not controlled by the ordinary means, as in a hemorrhagic diathesis, cut a plug of wood resembling the root, cutting a few creases in it, around which wind a little cotton saturated with the perchloride of iron. In this way the most obstinate hemorrhage is easily checked.

Dr. Atkinson. The bleeding, in such a case, is not from a hemorrhagic diathesis, but from a broken artery which is attached so that it cannot contract. All you have to do is simply to take a bur and give it one turn in the bottom of the socket, and kiss your patient good-by! Criticism is a two-edged sword; it is not fault-finding, but it is a test of truth. Admires the spirit of the report, and would only suggest that we give in such reports less of individual opinion, and more of principles. The mechanism of filling teeth has entered into this discussion more than the principles involved. At the cervical walls an immense preponderance of failures occurs. That is where we need the greatest care. What constitutes this? Keeping the cavity so that we can see.

How anybody can fill under the gum satisfactorily without the dam, is at a loss to see. Cut away the excess of gum, instead of wedging back with cotton; drill a hole above the cavity and put in a screw, and hook the dam over it, and file and finish off the screw when you do the filling. Use whatever means pleases you, but, by all means, do good work. He has not backslidden any farther than to go back to No. 30, since the introduction of heavy foil. It is a saving of time sometimes to be slow. Put on the rubber without getting excited. Only a small minority obey the law of contour; until that is done, there is no perfect dentistry. The teeth are analogous in their position to the staves of a barrel, and you cannot afford to lose one of them. Even the wisdom-teeth are proper abutments, and the breaking of the arch is where the mischief comes in. There is no difference of opinion about good cheap dentistry. Cheap is not low-priced; shoddy is not cheap. He has yet to see the first man that does not ask enough for what he does.

Dr. Webb. Instruments of almost every conceivable form, with the smooth, plain, or convex point, along through various grades of serrations, the broken point, and then the alloyed gold points,—all have been used and eulogized. The cohesive property of gold was recognized, and then, too, Dr. W. H. Atkinson introduced and advocated the mallet as a valuable aid in the impactation of the precious metal, and both were adopted.

To-day, the cohesiveness of absolutely pure gold is deemed quite sufficient for all purposes as a filling, except that it is best to pass it through the flame of alcohol when the impactation is to be carried to a restoration of contour.

To-day, also, we have electricity applied as a force for the impactation of gold, and those who have used that representation of true genius—the improved electro-magnetic mallet—cannot but feel thankful to the inventor for it.

The lightning-like blows impact gold to a greater degree of perfect solidity than has otherwise ever been accomplished.

Dr. Palmer asked how labial cavities were to be kept dry without the dam.

Dr. Shepard. Get everything ready on the table. Use a rope of bibulous paper under the lip. Don't allow closure of the mouth; use care not to wound the gum. Had filled such cavities which had failed under the best operators, and the patients stated that they had experienced less pain.

Prof. Taft. The preservation of the pulp is a very important matter, and one of the most difficult things a dentist is called upon to accomplish. He is sad and sorry to hear of destroying pulps—poisoning them to death. We must get over this impression. In many persons the

destruction of the pulp is equivalent to the loss of the tooth, and under the most favorable circumstances the loss of the pulp insures the loss or detriment of the tooth. Its course is onward to the destruction of the tooth, and this ought to be engraved with a pen of iron upon the mind of every dentist. A great many say they cannot save the pulp, but a great many do save them,—in almost all cases. Some fail, but what physician poisons his patients because he cannot save them all? We should recognize the importance of the organ, and save every pulp possible, and make an effort to save every one. How shall it be done? Pursue a rational treatment as with other tissues. Knowledge will enable us to know what to do. If the pulp is in a condition of comparative health, it should then be the aim simply to close it up. Cover it with some substance that will be acceptable to it, that will not decompose, will not produce pressure, and is a non-conductor,—seal it up, and all will be well. If it has been exposed or diseased, the treatment will depend upon the condition of the system. Dr. Rehwinkel says, in his neighborhood they have so much malaria that they have to take quinine by the ringing of the bell, and he can't save pulps in that locality. Systemic conditions must be recognized.

Dr. Thomas agrees with Prof. Taft as to the propriety of efforts to save every pulp. But what about teeth that we find remaining in the mouth after the pulp is destroyed,—dead teeth as they are called? They have given him a great deal of trouble. Within the last two years he had excavated and cleaned thoroughly, and filled at once, and then made an opening through the gum with a lance to the apex of the root, cutting down the bone with a trepanning instrument.

Dr. Rehwinkel is as anxious as any one to save the pulp; but there are cases where we can serve patients better by destroying it in the most harmless manner. It is not in his opinion wrong, but good practice, to resort to arsenic, and he uses it because he don't want to be two weeks about it, and has yet to see the first case of bad effects clearly traceable to its use.

Dr. Taft. The same treatment will not serve in all cases. Local treatment will be required, and the first step is to clear away the debris, remove all irritating matter, and correct the offensive condition by a disinfectant. It is difficult to give a formula for all cases; carbolic acid, chloroform, permanganate of potassa, etc., may be employed. It is not always good to deplete—sometimes it is well, but sometimes bad. Then use stimulants, tonics, astringents; the object being to relieve the part, and bring it to a state of health. Pulps may sometimes be saved where there is suppuration. Uses simply oxide of zinc with creasote, over that oxychloride; afterwards fills with gold. Within the last or three months, has used lacto-phosphate of lime, or lactic acid and

phosphate of lime, which can be kept without deterioration. Mixes them into a paste and applies to the pulp in the same way as the oxide of zinc and creasote.

Dr. Allport. Though he has not tried this preparation, has tried treating a pulp in his own person with satisfaction. The treatment of the pulp is the same as that of other parts of the body. For chronic periostitis has used, in a large majority of cases, simply aconite of high potency,—the third dilution (homœopathic), as many pellets as can be put on a three-cent piece. Do not give too much, and stop as soon as the patient begins to get better. Usually two doses will suffice. Has been astonished at his success with it. Formerly had used mercurius. In troublesome cases, alternates with antimony.

Dr. Hunter had accomplished the same result with a few drops of tincture of aconite, applied in water, locally.

The subject was then passed.

The Committee on Appliances made a report, of which the following is a synopsis :

The committee merely mentioned the articles brought to their notice, among which were—

A vulcanizer, with a self-packer, and a gravity safety-valve. A floss-silk holder for the pocket or office use. An instrument for separating teeth, devised by Dr. O. A. Jarvis, a valuable adjunct in operative dentistry ; a tongue and cheek protector, used in connection with the corundum disk on the engine ; separating files with corrugated handles, rendering them more easily held between the fingers ; a triplex damp-punch, simple and convenient. Improved retaining screws with split heads, which give them an advantage over the ordinary screw. A set of four scalers, worthy of attention. Some forceps, burs for engine, and excavators, apparently of fine material and excellent temper. A patent process for packing rubber, which was considered simple and effective. The S. S. White dental engine, containing valuable improvements as regards the pitman and flexible arm, running smoothly and noiselessly, and allowing a perfect control of the hand-piece in operating ; an hydraulic lift attached to the Harris chair, which accomplishes the desired end with very little effort ; an air-cushion in the back of chair ; also a changeable seat and extension back ; a vulcanizer so designed that it may be set at any given pressure, and, so set, will not vary from this point ; also, Green's electric engine as improved by S. S. White, heartily recommended to those not employing an assistant ; some hard rubber disks, to be used in polishing approximal fillings, highly spoken of by those who have used them.

An electric plugger was exhibited in operation : a beautiful instrument, with no apparent deficiency of power.

An improved vulcanizer, containing an arrangement for closing the

flasks after being placed in the vulcanizer, and that without producing any strain on the bottom.

The subject of "Etiology" was then again taken up, and Dr. McQuillen made a report. [This report will be published in a subsequent number of the DENTAL COSMOS.]

Dr. Noel called attention to the action of lactic and acetic acids in the production of decay. Saliva has, as is well known, the power of converting phosphate of lime into grape sugar. Cane sugar is often present in the mouth, and this, by appropriating the elements of water, may be converted into grape sugar. This is composed of the elements carbon, hydrogen, and oxygen; and by a heat of about 98° may be decomposed into lactic acid, which immediately attacks the dentine. Acetic acid may also be generated. The tribasic phosphate of lime, of which the dentine is composed, is converted into the bibasic, and can then be washed away.

Adjourned.

Evening Session.

The association was called to order at the usual time by the president, the special business being the selection of place of next meeting, and election of officers.

Upon the first ballot for next place of meeting, Niagara Falls, the only place nominated by the committee, was selected.

The election of officers was then proceeded with, with the following result :

President.—M. S. Dean, Chicago.

First Vice-President.—G. W. Keely, Oxford, Ohio.

Second Vice-President.—Jas. S. Knapp, New Orleans, La.

Corresponding Secretary.—G. L. Field, Detroit.

Recording Secretary.—C. Stoddard Smith, Springfield, Ill.

Treasurer.—W. H. Goddard, Louisville, Ky.

Executive Committee.—(New members) A. H. Brockway, G. C. Daboll, and S. B. Palmer.

Adjourned.

FOURTH DAY.—Morning Session.

The association was called to order by the president.

The report of the treasurer was read and accepted.

The following resolution, introduced by Dr. Shepard, was passed unanimously :

Resolved, That the American Dental Association fully appreciates the promptness with which Dr. S. S. White responded to the requests of the dental profession, to take the management of the suit for the ascertainment of the rights of the public in regard to the use of vulcanite for dental purposes, and would respectfully request him to con-

tinue his valuable aid in carrying up the case for final adjudication by the Supreme Court of the United States, pledging him our moral and material support in defraying the expenses that may be incurred in the future.

A volunteer paper by I. Douglass, of Michigan, was read by Dr. Cushing, giving an account of two cases of apparent death from chloroform. The first case was that of a patient having palpitation of the heart, but no organic disease. After having twenty teeth extracted, the patient recovered consciousness, but immediately upon ascertaining the fact that the teeth were out, she relaxed and ceased to breathe. A battery which was near was immediately called into requisition, and with the first application the respiration and pulse appeared, and the patient made a speedy recovery. Fear had undoubtedly acted as an antidote to the chloroform, and the removal of that caused the syncope.

The subject of "Dental Education" was then taken up, and the report of the committee, written by Prof. McLain, of New Orleans, was read by Dr. Knapp. We give a synopsis of the report, as follows:

Of late years a gradual loss of confidence, amounting almost to distrust as to the efficacy of dental colleges, has taken place in the minds of leading practitioners; it is believed that graduation has become too facile, more from rivalry among the colleges than incompetency of the professors. No body of men has made greater pecuniary and personal sacrifices than these professors, laboring and expending money without either present or hope of future emolument. But the colleges have failed to meet just expectations; the profession looks to the colleges for the training necessary to place it in accord with the spirit of progression of the age. The colleges have been somewhat remiss in elevating the standard proportionally to our advance. One cause is the custom of examinations being conducted by the professors, who may allow sympathy to relax their rigidity, if not lead to partiality. Another cause is the practice of graduating students on attending two sessions, which is equivalent to making dentists in eight months of actual study. So limited a period is insufficient, coming unprepared as the student often does. Mechanics would consider a two-years' apprenticeship insufficient to learn a trade; how can we expect that a knowledge can be gained in that time of a profession, involving high skill and acquaintance with several abstruse branches of science? The wonder is that the graduates are ever more than mediocre. Lack of previous education prevents the colleges from adopting a higher curriculum. Statutory enactments will not cure the evil as to colleges; but regulating laws would shut out the grosser and more reprehensible elements. What is needed is that the profession furnish the colleges with better material, and they should not accept pupils who have not a good preliminary education and natural fitness, and should obligate

them to study three years and pass through a dental college. The colleges should confide the examinations to boards outside of the institutions, and thus avoid the charge of favoritism. They should lengthen their courses to five or six months, and require an attendance of from three to five sessions as a condition of graduation. These measures are a matter of self-preservation with the colleges, for at the present rate of increase, the profession will soon be overrun, and its remunerative prospects destroyed, and the reproach incurred would affect them injuriously. The first college adopting these measures might temporarily suffer, yet in the end it would be compensated and would gain the support of the profession.

Dr. Keely followed with an additional report, of which the following is a synopsis :

Dental surgery is a legitimate specialty of medicine, and should assume its true functions in the healing art, by the principles of which its processes should be controlled. Its basal elements are a thorough study of the whole organism,—and such knowledge is now required. Mechanical skill with a few general ideas are not now a preparation for dental practice; knowledge is power in this 'as in other branches. The medical profession has been cold toward us, and the fault is with it. Let the dentist demonstrate his worthiness, and this will disappear. Preliminary literary culture is demanded. The mind and heart must be trained. Dental practice needs manhood as its basis. The college diploma is often a fraud, but so transparent as to deceive only the ignorant. What is truly represented by it is the least that should satisfy the student. It is of little importance whether the medical knowledge is taught in a medical or a dental college if it is well taught, and the preparation honestly and thoroughly made. The student is then prepared to appreciate his special branch of study, and his time will be saved for its higher elements. Impatient aspirants may turn away in disgust, and seek for a shorter road. Let such remember that the time for success in this way has passed; any scientific calling demands far more elaborate preparation than in the last generation. Daily requirements of practice call for a more advanced and scientific knowledge. A young man who rashly assumes these duties, condemns himself to a meagre share of the benefits of his calling, and exposes his patients to the consequences of his ignorance. The student should be under the direction of a preceptor who is competent, and of recognized skill, who will require from three to five years' study. A sensible preceptor will unfold to the aspirant his deficiency in any element of success, and give broad views of professional duty; will moderate his impatience to assume those duties. He will point out the vast number of ill-educated men sent forth from the rival medical schools, and deprecate this policy in the dental colleges. To swell the number of grad-

uates, the standard of attainment must be lowered. There are schools which do not yield to this temptation, and their diplomas stand high, because they indicate a definite amount of preparation. The error of establishing a dental college in every great city should be avoided, and effort should be concentrated at a few points, say three or four, which will be ample for our whole country,—one east, one west, one south, and, when the time arrives, one on the Pacific coast; for this number an endowment could be easily secured. The professors are at present poorly paid, and obliged to eke out their subsistence by professional labor. This interferes with the value of their instructions, which are sufficient to tax fully a first-class mind. No professor holds his position except at a pecuniary sacrifice, which should not be required. Our profession owes to them a debt of gratitude. This policy of concentration will ignore local interests, and provoke recrimination; but truth is ascertained only after sharp altercation. We should hold to the policy when its necessity is recognized, in spite of the clamor raised by interested parties,—its necessity is obvious. By limiting the number of colleges, an endowment can easily be secured, and each professor can receive a competent salary; but by dividing our means on a number of starveling projects, we shall inflict the same evils upon our profession which our literary and medical institutions are now deploring.

The subject was then opened for discussion.

Dr. John Allen said that dental education embraced more than that education which comes from others; it also embraced that which each man gives himself. The failure of dental colleges to discharge their duties, or rather of graduates to meet the requirements of practice, is due to the want of this second education. They settle down into mediocrity because they have a diploma. It is self-education that enables men to get beyond others. A celebrated painter said he mixed brains with his colors; we should mix brains with our work. The artificial branch of dentistry has been neglected, and it is lower to-day than it was thirty years ago, though on the whole our profession stands higher.

Dr. Walker said no perfect brain is found in an imperfect body. Dental colleges should go a little farther than they have been going. We should have a knowledge of the system beyond the mouth, which will enable us to avoid breaking down and spending months to recuperate.

Dr. Taft. There are many obstacles in the way of a thorough dental education. One rests with preceptors. Great care should be used in selecting students; inherent ability and preliminary education should be considered. They should have a good general education and a knowledge of the fundamental principles of medicine and surgery. A student going first to the dental college has no appreciation of what he is about to do. Let him understand what is before him. Do not say to

him that a year or two of private pupilage and two courses in a college will fit him to practice dentistry. Some societies have resolved that their members should not receive students for a less period than three years and two courses in a dental college. Our best students come from the offices of men who give them a thorough training. This body should go in advance of the local societies, and should make a clear pronouncement upon this subject, and no college in the country could ignore it.

Dr. Thomas. Some admit students to their offices, for pecuniary considerations, that have no business there. It is cruel to advise a young man to come into the profession in less than seven years. Students should go directly to a dental college, and not into an office; because no two practitioners have the same ideas. If there are men competent to take students, they are not the men who will do it, and for this reason he would prevent dentists from taking students.

Dr. Stockton. We live in a busy age; it takes but a little while to become a *grandfather in dentistry*; that is, to send out a student, who in a short time will have sent out his student. The Ohio Dental College once required as a qualification for students that they should know something of the English language; but the pressure was so strong that this has been swept from their books. New Jersey has a law requiring an examination before a board; and the board rejects every young man who is not thoroughly qualified. If none could enter the profession except a graduate, we should soon place our profession where we wish to have it, and where we must insist that it shall come.

Dr. Bogue. In New York there is a law and a board of censors. Does not conceive that the multiplication of State laws is going to affect graduates. The public opinion of dentists moulds the action of colleges. We have no standard. One school may take a stand that all will approve; another will sell its diploma for twenty-five dollars. We should take such a course that they will take a different stand from what they now do.

Dr. Butler. Diplomas should mean something. They are too cheap,—there are too many graduates. Would like students to graduate both at a dental and medical school, and then they would not have too much knowledge. Does not think it is policy now to send a student to a dental school, no matter how good. Fault is found with both schools and graduates, yet there is a disposition to multiply colleges. They ought to be simmered down to two or three, and faculties put in that are good for something, and endowed with a sufficient fund to give them good teachers. The best schools are those that give the students ample clinical instructions. The teaching of mechanical dentistry amounts to little,—we are not so far advanced in that department as we were thirty years ago.

Dr. Allport. A great deal can be said about this question, but the thing is to say something practical. It is easy to blame the schools, but not so easy to suggest some practical plan whereby a thorough education will be more general. There is a desire that dentistry should be regarded as a specialty of medicine, but the present course of instruction in either private offices or colleges is not the best to secure that end. The same course of study should be pursued that other specialists in medicine go through with; books are studied and lectures attended for three years; and the extra time is devoted to the study of the special studies; and these cannot be pursued until a general knowledge of medicine is obtained. The student of dentistry, on the contrary, simply takes a partial course of reading, and commences work in the laboratory; thus studying a profession and learning a trade all at once. No one expects a trade to be learned in less than three years' apprenticeship. Certainly even mechanical dentistry requires as much preparation as that; and to properly practice all branches, a man must learn both a trade and profession in that time. The study and practice should be divided. Let the mechanical dentist confine himself to that branch, and let the dentist who treats diseases of the teeth become fitted as a medical specialist in a medical college; let him breathe the atmosphere of medical teaching; then we shall have done the same that is done to make ophthalmologists and aurists. Designate mechanical dentists as you please, but drop the word *dentist* as soon as you can. We may have "dentologist" to designate those who operate on the natural teeth; the others may be called what you please, as "dentificer" or "dentician," but let them be called by different names, and soon they will be so recognized by the public, who will be better served than by the present practice.

Dr. Morgan is the oldest graduate belonging to this body, and feels entitled to be heard. There are entering the profession one thousand two hundred men each year, and of that number perhaps two hundred and fifty attend lectures. If the students can be got into the colleges, it will be a great advance. Admits that the colleges are not what they should be. Much stress has been laid upon the time required. Thinks that when a student can pass the examination he should have his diploma, whether in one year or ten. In some institutions that is the mode of procedure. In the University of Virginia there are only three professors, yet a diploma from that institution is the highest recommendation a man can have in the South. They examine at the end of one, two, and three years, and when a man earns his diploma he gets it, on the ground of qualification, and not length of time. If we can get the dentists of the country connected with the associations, we shall remedy some defects in education. In Tennessee there are two hundred and fifty dentists, and only fifty belong to associations; the others are beyond our reach, do not take our literature, never mix with the profession,

but squat down in the little towns. If we could bring them in contact with the more advanced in the profession, there would be less difficulty about students. We were among the first to require every student to give at least two years' time, and graduate before they proposed to engage in practice. It has had a wholesome effect, though it has not been lived up to.

Dr. Wetherbee. Public opinion is arrayed against the advance of the profession. The larger part of the people are of moderate means, and call on the first man whose shingle they meet. There are many practitioners who are not properly instructed in the mechanical department; you cannot divorce this department from the operative generally. Some practitioners keep their students for years and never instruct them an hour, or allow them to see a tooth filled. No respectable dentist should take a student for less than three years, and should require him to agree to attend a college at the end of that time and graduate. This association is a stumbling block to our advance. It is composed of graduates and non-graduates. Change the constitution, and allow no delegate to come here who is not a graduate, and you will have set an example to the whole country.

Dr. McQuillen. In listening to the annual criticisms of dental colleges in our national association, I am forcibly reminded of an utterance of that genial wit and humorist, the "Professor at the Breakfast-table," wherein he says,—“When nature invented, manufactured, and patented her authors, she made critics out of the chips that were left.” It takes time, labor, and thought to write a good book, or to found, manage, and maintain a college; but with a breath or stroke of the pen slight faults can be exaggerated into great defects, and unfounded assertions of unfaithfulness to duty made without due examination of their authenticity. No one can be more conscious of the shortcomings and deficiencies of dental colleges than those who are managing them, and endeavoring, so far as they can with limited means and inadequate support, to increase their sphere of usefulness. Do gentlemen appreciate the trouble, time, and expense that those who are engaged in teaching are subjected to? Would it not be well if, in addition to criticising these efforts, they would aid in the cause of education by contributing money towards endowing the colleges; or, better still, spend their time and money in establishing and maintaining dental colleges, and thus show the profession how much better they could do the work? Why not criticise private preceptors in their unquestionable failure to perform their duty? For the vast majority of accessions to the ranks of the profession come from private offices. The curriculum of instruction in the dental colleges, in place of being lessened, has been enlarged. Formerly a winter course of four months constituted the annual term; now, in addition to that, in some of the colleges, there are spring and fall

courses of lectures, while the dispensary and laboratory are open all the year, where every opportunity is afforded for acquiring a practical knowledge of the profession without additional charge to the student. The standard of graduation has also kept pace with this. Speaking not from isolated cases or a limited experience, but as one having had every opportunity of observing the men who have attended lectures in the medical and dental colleges in Philadelphia during the past twenty-five years,—the class of students entering and graduating from the dental colleges now, instead of being inferior to those of former years, are vastly superior in mental culture, for many of them have enjoyed every advantage in scholastic opportunities in the best universities of our own and foreign lands, prior to matriculating in our institutions. We are told that there should be fewer schools; that four would suffice, one in the east, one in the west, one in the south, and one on the Pacific coast. Has the gentleman considered the question in all its bearings? Colleges are established not merely to supply the wants of the present, but the demands of the future; not only to educate those who are to serve, in our land, forty millions of people in the present, but five hundred millions in the future. Again, if all engaged at present in the practice of dentistry who need educating, and the yearly additions to the ranks of the profession who come in from private offices without an education, were forced by State laws or an enlightened public opinion to obtain a collegiate education, the dental colleges now in existence could not accommodate them; indeed, with the present facilities, the best arranged institutions in the country could not give that practical instruction which is such an important element in dental education to more than one hundred students; whereas, on account of the different methods of instruction in medical colleges, five hundred to one thousand men can be taught the theory and practice of medicine and surgery.

A most melancholy spectacle is presented by some of our fellows who are constantly whining about the non-recognition of the profession. The question naturally suggests itself,—is the fault with the profession or the individual? A man of culture, ability, and executive capacity has no occasion to complain of indifference to his rights on the part of others, and it is the influence of such men that gives character and tone to the profession in which they are engaged.

Dr. Crouse. To improve the profession we must improve its material; but he does not agree as to the superiority of graduates over others. Their average is very little above those outside. There is something wrong either with the material or the education when men associate themselves with the worst mountebanks in the country. There are some earnest laborers in the colleges; but the fact that when one college springs up in a city, another must spring up, shows that it is a kind of quackery. One set of men say that another set shall not

be above them in being called college professors. Colleges can't educate one hundred properly. He would not send a student to any college, but would give him his dental education, and would send him to a medical college. A dentist should be a great deal more than educated as a manipulator, and that can be done a great deal better in an office than in a college. We cannot expect to be recognized by scientific men, until we become scientific. To make dentists, you must have the right kind of preceptors and the right kind of material.

Dr. Atkinson. Dental education is really very far off, if we have to go back through surgical, medical, and classical, to academic education before we can get it. Medical education is the basis of dental education. He has his ideal, but we have to take things as they are. Who of us that has come through all the painful labor, don't know the difficulty of getting what little education we have? If we were required to produce a voter twenty-one years old instantler, with a nice beard on, he don't know how it could be done; we will have to go back to the good old way, begin right, and very likely it will come out right. The mechanical aspect of dentistry, like surgery, enables us to perceive when we have coincided with law or opposed it. Medicine makes mistakes, and the grave covers them. The self-sufficient iconoclast tears valuable organs from their location, and puts them out of the way. I am with and against every man who has spoken; with him so far as he comes up to my conception of the truth; and when he don't I yearn to illuminate him, because I know I have the truth. Ain't *we* the gentlemen, and *they* the boors; ain't *we* the Christians and *they* the vandals the world over? What is education? It is mental feeding and nothing else; it is knowing what kind of food to eat. Sometimes I wish that there were no such things as diplomas. If there must be, do have them say what they mean, and mean what they say. Many in this room have them who never attended a single lecture, and yet they are worthy of them. They do not go through the right way, they say. The brave men who have practiced the self-education spoken of by Dr. Allen,—did they make themselves worthy? No; the blessed love of the fountain of light made them what they are; all they know was received at a time when they were in a receptive condition, and were hungry to know, and the divine grace came in and illuminated their understanding, and revealed to them the truth. When we get hungry for a breath we take it; so when we want education very bad we get it,—where there is a will there is a way.

I wish there were nothing but certificates of advancement. Graduation will leave us but babes; we are not complete in our best apprehensions. Diplomas as a rule are a damage, for they entrap a man into the idea that he has been recognized, and has finished. That is not the intention. It is simply an admission fee to the show,—to where

the divine grace may come in and possess him,—make him luminous, and perceive the truth, and then he will embrace it; for there is not a sinner on the earth that will go the way of darkness by preference, the whole pulpiter to the contrary notwithstanding, and I am a *pulpiter* too. (Applause.) I am not ashamed of the meanest outside dentist as compared with the meanest outside medical man. I will cast my lot with the dentists; they have more goodliness as a class. Then how shall we get our education? By honestly seeking it, irrespective of how much it will cost. Although we claim to be Christians, we are almost to the last man of us playing Jew,—trying to buy cheap and sell dear. *E* (Greek), out of, and *duco* (Latin), to lead—a hybrid—a Greek-Latin mule that we are riding on. No wonder we tip over the fence, first one way and then another, half milk and half water. Give me hungry students. I can talk to them as far as I can see them. What we need is soul to soul communion, mind to mind interpenetration like the interpenetration of gases, until every one shall be satisfied and say *yes* from the bottom all the way up. When we know that the inquiries that arise in our own minds are satisfied, we are educated, and not till then.

Dr. Osmond. In spite of the poor compensation which professors receive, there are many who glory in the title. Many aspire to it who illy deserve it. Is in favor of a national board for the examination of students, and also of professors. A school is established by a few men who get together and obtain a charter; the professors are not appointed by the trustees, but the trustees by the professors; as a general thing, the trustees are simply a farce. Though the professor is not compensated, he stands before the public as a professor, and obtains better fees in consequence. Students are obtained by circulars, and by conferring honorary degrees to secure the influence of the recipients. In some institutions the professors buy in the stock and obtain control, in order that they may be everlasting professors in it.

In many cases the diplomas are bought. Let them be given to those that deserve them, and be without price and above suspicion. The professors should not examine the students; a board of the national Government should examine both them and the professors. Some of the worst quacks are graduates,—laughing-gas and rubber quacks. One graduated, to the speaker's knowledge, after a three-weeks' session, who had never pulled a tooth in his life until ten months before; in four months he sold twenty-one pwts. of gold which he had taken from teeth he had extracted. Over such shops should be written Dante's motto, "All hope abandon, ye who enter here."

Dr. Watt. Is not now connected with any college, though he had once been, both as student and teacher; in that institution great care was taken that the students should give evidence of moral character and

manly disposition. Some proved derelict afterwards,—but there is no professional or classical institution that has not had the same experience. One year the questions were printed, and the student had no opportunity of knowing what they were to be, and the examinations were lengthy and rigid. His alma mater has been about as much disgraced as any; one of its graduates is advertising to do rubber work for eight dollars.

Dr. Rehwinkel. Dental colleges have been very severely criticised, but do we do our duty as educators, as a body, and in societies? These last alone have been the means of bringing our profession up to its present standpoint, though many go away from them disappointed. We are all of us teachers in the true sense. A different course will be pursued by dental colleges at some future day. They will be made to feel that they have given grounds for disappointment, and the profession will see that they have failed to encourage and sustain them. Preceptors are remiss, and the colleges have to go down and commence from the very foundation for want of a preliminary education, and in many cases the student must unlearn what he has learned. In Germany, public opinion is much divided; some insist that the student shall go to a medical college and become an educated physician. There is a sharply-drawn distinction between those who have diplomas and those who have not. *Dr. A.* may be no better dentist or operator than *Mr. B.*, yet the latter is cut off from speaking in an assembly of this kind. Others there, especially those who have more thorough knowledge of this country, favor the American system, and point with force and truth to the fact that, so far as accomplished operators or manipulators are concerned, the Americans are far in advance, and claim that they stand as high in scientific attainments.

Dr. Butler offered the following, which was adopted :

Resolved, That it is the opinion of the American Dental Association, that the time has fully come when degrees should not be conferred by dental colleges upon any student who has attended but one course of lectures.

Adjourned.

Afternoon Session.

Met pursuant to adjournment.

On motion of Dr. Judd, it was resolved that the "Transactions" of former years now on hand be given to members of the profession who may call for the same, and the remainder be donated to local societies who will pay the cost of transportation. (Drs. L. D. Shepard, Boston; W. H. Goddard, Louisville; A. M. Leslie & Co., St. Louis; and M. S. Dean, Chicago, may be applied to for these volumes of "Transactions." See notice by Dr. Goddard in the November number of the DENTAL COSMOS.)

The Nominating Committee reported the following list of standing committees, who were unanimously elected :

Physiology.—J. H. McQuillen, E. S. Gaylord, J. R. Walker.

Pathology.—H. Judd, L. D. Shepard, J. S. Knapp.

Histology and Microscopy.—J. Taft, E. D. Swain, W. H. Jackson.

Chemistry.—H. A. Smith, S. B. Palmer, J. S. Cassidy.

Therapeutics.—E. A. Bogue, W. O. Kulp, C. C. Canine.

Operative Dentistry.—G. H. Cushing, C. S. Stockton, S. H. McCall.

Mechanical Dentistry.—F. H. Rehwinkel, J. F. Canine, J. Johnston.

Dental Education.—G. W. Keely, A. H. Brockway, S. Welchens.

Dental Literature.—J. S. Knapp, L. G. Noel, C. D. Cook.

Etiology.—H. S. Chase, E. C. Hawxhurst, C. S. Smith.

Prize Essays.—I. Forbes, G. L. Field, R. B. Donaldson.

The regular order of business was resumed, and the subject of dental education was further discussed.

Dr. Horton. We should not criticise too harshly in this matter except in the spirit of liberality. Daniel Webster, it is said, tore his diploma to pieces upon the platform at his graduation, and told the faculty that he would not build upon it, but would build upon his own foundation. We know what his reputation was. It is not necessary that we should have a diploma; if we have the knowledge we need not fear being recognized. Will stand with Dr. Atkinson with the dental profession. The dentists will stand favorably as compared with medical men everywhere.

Dr. Judd. If we are not specialists of medicine, what are we? As to whether we are recognized as we deserve, has views different from those that have been expressed. When we take a fair view of the subject, we have no right to complain. The National Medical Association requires that its delegates shall be medical men; if that body should see fit to send a delegate here who was not a practicing dentist, we should reject him. A few journals have sought to throw discredit upon the dental profession, but the great body of physicians recognize dentists to the fullest extent they have a right to demand. If they recognized all of us as polished physicians, they would make a mistake; but they are anxious that we should educate ourselves generally, and stand upon the same footing as oculists and other true specialists. If we desire to be specialists, we should make ourselves such; educate ourselves as medical men; and the best way to do it is in a medical college. The medical profession appropriates the best materials as teachers, and if we desire that education we must get it where the best teachers are employed. If there is a prejudice against us, how shall we eradicate it better than by allowing our students to sit side by side with them, and show that we are their equals? The colleges have

done a great work, but are not all that they ought to be. This discussion will have a great deal to do in shaping their future course, and will improve them. This association should keep a close eye upon these institutions, and eventually control them. Some schools are kept up for the benefit of the professors, and therefore the control of the institutions should rest with the profession at large.

Dr. Bogue offered the following :

Resolved, That it is the sense of this association that no dental student should be graduated by any dental college without at least three years' instruction, including private pupilage and college instruction ; the latter should in no case embrace less than two regular courses.

Resolved, That this association suggest to the different colleges of the country to appoint a common Examining Committee, consisting of five members, none of whom shall be in connection with any dental college, whose duty it shall be to examine all applicants for graduation, and decide upon the same.

Dr. Judd offered the following :

Resolved, That this association recommends to all local societies the adoption of rules prohibiting their members from taking students for a less period than three years, or for such a time as will complete a three years' pupilage.

These, by vote, were laid over one year.

The committee to co-operate with Dr. S. S. White in defending the rights of dentists against the Vulcanite Company, being called upon, Dr. Judd made a brief report. The thanks of the association were voted to the committee, and it was continued.

Dr. Knapp offered the following :

Resolved, That the thanks of this association are due, and are hereby tendered, to the Michigan State Dental Protective Union for the energetic, and so far successful, manner in which its officers have resisted the claims of Josiah Bacon and the Goodyear Dental Vulcanite Company.

Carried.

Dr. Allport offered the following amendment to the Constitution :

"That the American Dental Association will hereafter admit no delegate who shall enter the profession without first having graduated at some reputable medical or dental college."

Laid over till next year.

The committee to prepare a circular for the information of the public on the subject of "Care of the Teeth," requested further time. Granted.

The committee on the Barnum Testimonial Fund also reported progress, and asked further time, which was granted.

Dr. McQuillen gave notice of a proposed change in the By-laws, making twenty-four members a quorum.

The newly-elected officers were then inducted into office by Drs. Morgan and Allport.

The report of the Committee on "Mechanical Dentistry," written by Dr. Swain, was then read. The following is a synopsis :

The report noticed no improvement during the year, and indeed stated that the novelties of the year were almost utterly worthless, of which vulcanizable gutta-percha was quite so. The metallic alloys have failed to come into general use. Rose pearl, owing to its complicated method of manipulation, has not grown into general favor, although it appears to possess the properties of a durable base. Celluloid has grown greatly in favor on account of its simplicity of manipulation, and is quite extensively used.

[The report then described the recent improvements in its manufacture, as already given in our report of Mr. Hyatt's remarks before the Southern Dental Association at St. Louis.]

It is a better conductor of heat and cold than rubber, and gives better adaptation to the parts. Aluminium, which promised so well, has been proved to lack durability ; in alkaline mouths it is easily destroyed,—blister-like spots appear in contact with the mucous membrane, which soon become holes. It may be owing entirely to impurity of the metal. If this is the case, we have a metallic base in many respects superior to all others. Many of the objections to rubber may be obviated by using the black variety, which contains no vermilion, and is stronger. No improved machinery for the laboratory is noticed except the steam celluloid apparatus, and Hopkins's regulator for the vulcanizer, which automatically turns off the gas at any desired length of time. The report entered a protest against the proposed separation of the mechanical from the operative department of dentistry, particularly the plan of leaving it optional with the student in college whether he shall become proficient in the mechanical department. The profession is desirous of improving in this direction, as is shown by articles in the journals on improved methods of setting pivot teeth, and the efforts to produce a substitute for vulcanite. We are dissatisfied, and there is no reason why the colleges should at this time throw obstacles in the way of advance. The two branches, except in large cities, and even there only partially, can never be separated by the general practitioner. The college which graduates a student incapable in this direction, not only does the individual an injury, but possibly a community. An ambition to excel in this direction would soon make an advance. This department is not to be elevated by being made a specialty. The man who cares for the teeth of a family is the one to replace them when lost. The teachers in our schools, and those who pride themselves on their ability to restore, are the men to elevate this almost dead arm of dentistry.

The hour for adjournment having arrived, the remainder of the subjects were passed, and the association adjourned to meet at Niagara Falls, on the first Tuesday of August, 1874.

PENNSYLVANIA CENTRAL DENTAL ASSOCIATION.

THE Pennsylvania Central Dental Association will hold its first semi-annual meeting in Reading, Pa., on the 8th of December, at 10 A.M. The counties of Berks, Lebanon, Dauphin, and Schuylkill are comprised in the district wherein the above-named society was organized on the 30th of October, at Lebanon.

P. K. FILBERT,

Corresponding Secretary.

CORRECTION.

DR. BOGUE requests the correction of an error in his remarks quoted on page 552, DENTAL COSMOS for October, where, speaking of Lawrence's amalgam, he is made to say *pure* silver instead of *coin* silver. He also objects to the title of professor, which is there applied to him.

He objects, likewise, to the language attributed to him on page 530, same number, as not expressing his meaning. The remarks made by him on that subject were as follows :

The frequent use of the word "nerve" by dentists, when the pulp of the erupted tooth is meant, leads one to believe that some of the more obvious changes that take place in this pulp in nearly all cases of odontalgia are frequently overlooked.

If the body within the tooth were really a "nerve," there could be no such pain as "tic-douloureux," or jumping toothache, since this manifestation proceeds from an engorgement of the circulatory vessels of the pulp, to such an extent that the beatings of the heart are felt by the nerves of the pulp.

Indeed, the sequences of cause and effect in the usual form of toothache may be roughly stated as follows: First, irritation, caused by near or complete exposure to thermal changes, the contact of foreign bodies, or the atmosphere even, by means of a cavity of decay, or a fracture, or a blow; secondly, inflammation, caused by a continuation of the irritation, and characterized by an acute pain, often throbbing, sometimes intermittent, generally more severe when the patient is in the recumbent posture. Results (or effects),—1st, superficial ulceration of the pulp; this occurs generally after free exposure, and usually is continuous if left to itself, until the pulp is destroyed; 2d, strangulation of the pulp at the apical foramen through congestion, and then its putrefactive disintegration, in which case the usual result is the injection through the apical foramen, and beneath the peridental membrane, of these decomposed particles, through the instrumentality of the gases of decomposition, developed as above described; lastly, the *suite* of processes put into operation to expel these particles from their lodgment, known as alveolar abscess, which is almost exactly analogous to the festering that takes place when the child runs a sliver into its finger and it is left there.

PUBLISHER'S NOTICE.

CLOSE OF THE VOLUME.

THIS number completes the sixteenth volume of the DENTAL COSMOS.

We are glad to be able to state that the subscription list is steadily increasing, and is now larger than at any previous time since its publication.

We cannot believe that any dentist could fail to obtain information from its perusal worth far more than the subscription price, and should therefore be pleased to see the list of subscribers largely increased.

We shall adhere to the system of *cash payment in advance*, and ask as a special favor that all who intend to subscribe for the next volume will do so promptly, that we may determine the number of copies to print.

The first number of the seventeenth volume will be published January 1st, 1875, and succeeding numbers on the first of each month following. Dr. J. W. White will continue in the editorship.

SAMUEL S. WHITE.

EDITORIAL.

ONCE more we must explain to contributors, whose communications have not appeared, that the lengthy report of the proceedings of the American Dental Association has crowded out various matters of interest, original and selected.

An extra amount of space has been afforded in this number to the above report, in order to avoid carrying it into the next volume.

GYNECOLOGICAL HOSPITAL.

WE notice with pleasure the establishment in Philadelphia of a gynecological hospital and infirmary for diseases of children.

The medical board consists of John J. Reese, M.D., Joseph A. McFerran, M.D., and Theodore H. Seyfert, M.D.

BIBLIOGRAPHICAL.

THE PHYSICIAN'S VISITING LIST FOR 1875. Philadelphia: Lindsay & Blakiston.

The value of this little pocket companion may be inferred from the fact that this is the twenty-fourth year of its publication. It is admirably adapted to the needs of the physician.

HINTS AND QUERIES.

CAN any one tell us what to do with our rubber dam after using it? Is there no way of making it useful?—S.

ANSWER to H. E. W., in August No. of DENTAL COSMOS. My way of holding replanted superior incisors is to take impression, make a plate, then extract the tooth.

I have been using liquor calcis (lime-water) for three years as a mouth-wash with great success.—SAMUEL HILLES, *Red Oak, Iowa*.

QUERY.—“What is the best means of removing wax from the fingers?—X.”

ANSWER.—Not to get it on the fingers. One-fourth part of the skill exercised by X. in filling an ordinary cavity with gold, would keep all wax from his fingers.—Y.

IN looking over the proceedings of a dental association in the September number of the DENTAL COSMOS, I observe the following question: “What should be done for patients that are so easily nauseated that they cannot have an impression taken?” Salt was recommended in the form of a gargle, and confirmed by others, etc. I have found bromide of potassium, in doses of thirty grains three times daily, to accomplish the purpose.—G. W. HUDSON.

CELLULOID vs. RUBBER.—After three years' experience of celluloid, both in wearing and in working it, I find it far preferable to rubber as a base for artificial teeth. It is more comfortable and pleasant to the mouth; the color is better; it is lighter and more elastic, and, with the same care in working, a better job every way may be produced than with rubber. I formerly had trouble in working the celluloid, from not understanding the material; but since the base has been improved, I can make a good case every time, and have done so for a year, by following the latest directions for its manipulations. My wife and I have each worn an upper set for nearly three years on celluloid. For three or four years previously we both wore sets on rubber. Nothing would induce us to change the celluloid for rubber for our own mouths, and all my patients who have worn the celluloid, after wearing rubber, prefer the former. I am now wearing the same set I made three years ago, and want nothing better. I would not change it for a gold base, much less for a rubber one.

A broken case of celluloid is much easier repaired than a rubber case, for if a block or a tooth is broken, all that is necessary is to remove the broken pieces of porcelain, cut away the celluloid until there is room to put in the new block or tooth, — taking care to cut away no more than is needful; fill the interstices with wax; place the case in the plaster the same as for repairing a rubber set, and heat in the oil or steam apparatus, pressing the flask together. When removed, the celluloid will be found to fill all the space occupied by the wax.

I generally leave my flasks one-sixteenth of an inch apart, by placing a piece of match between the two edges of the flask; and after opening the flask, before putting it into the boiler, I cut the surplus plaster away, so as to allow the flask to come together under the pressure of the screw.

I think, if dentists would become acquainted with the working of celluloid, and the comfort it affords patients, they would prefer it to rubber, with its many imperfections, its unsightly color, the irritation of the mucous membranes of the mouth which it occasions, and its liability to break.—J. E. GRANT.

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